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ANIMALS OF THE AUSTRALIAN BUSH

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AUSTRALIA has been renowned from earliest times as a country of contradictions and anomalies. In this great southern island-continent many primitive forms of animal life, long extinct in other parts of the earth, have survived almost unmodified, so that Australia has been well called a land of "living fossils". Even man himself, isolated from his fellows and surrounded by this primitive animal life, lagged behind in the march of progress, and the Australian Black-fellow has retained his Palæolithic culture.

From time immemorial a black swan was regarded

as the height of improbability and ranked close to the white elephant in popular imagination. But even the scientific world, long innured to shocks, cavilled when confronted with the first reports of the duckbilled platypus and the echidna—animals that laid eggs like reptiles and suckled their young like mammals! But when these strange rumors were proved to be founded upon hard fact the world was prepared for all that was to follow.

If it were possible for you to be transported suddenly into the Australian bush you would indeed find yourself in a new and strange world. Your attention would be



MOTHER AUSTRALIAN RING-TAILED OPOSSUM AND HER YOUNGSTER

This interesting mammal of the island continent inhabits dense, scrubby country, generally near water, and, unlike the brush-tailed opossum, builds for itself a bulky, domed nest



THE STRANGE ECHIDNA OR PORCUPINE ANTEATER

One of the most primitive of mammals, looking like a porcupine but having reptilian characters and laying eggs

As he walks he emits a curious snuffling sound from his nostrils. In spite of its beak-like appearance, however, the snout of the echidna is quite unlike the bill of a bird; it does not open mouth-like along its length but is just an elongated horny snout with two nostrils on the upper surface near the tip and a small mouth aperture below. Through this protrudes a long, slender, worm-like tongue several inches in length, which the animal employs in picking up the small, black sugar ants that form its chief food supply.

attracted first by the birds, for you would be greeted by the loud screeching cries of gorgeous cockatoos and parrots, and in the morning you would awaken to the loud ringing "laugh" of a "Kookaburra". But if the bird life of the Australian bush is new and wonderful, the mammal life is much more so. At first sight a few forms like the echidna, or porcupine anteater, and the flying phalangers, or "flying squirrels", might look like familiar friends, but the resemblances of these creatures respectively to the porcupine and the true flying squirrels of the Old World is only a superficial one.

If you were to come suddenly upon an echidna, approaching him from the rear, you would see only a palisade of black and white quills that would remind you at once of the porcupine—whence the popular name of the animal is derived. If, on the other hand, you were to encounter the fellow head-on you would have some difficulty in believing the evidence of your eyes. For, while he is clad completely in defensive array of sharp, stout spines, he carries a long horny snout, like a bill! At the slightest sound or the least alarm he will tuck his curious snout under his body and drop flat upon the ground, and if you are not quick he will have burrowed almost out of sight before you can prevent him. But remain still and you will be rewarded by one of the queerest sights imaginable. He walks with a slow, measured, ambling gait, rolling his body from side to side as he goes, exploring every nook and cranny with his sensitive, tactile snout.

ONE OF THE CURIOUS MAMMALS KNOWN AS THE BANDICOOTS

The long-nosed bandicoot, about the size of a rabbit, is abundant in south-eastern Australia. It builds a domed nest

But even the curious snout and the long slender tongue are not the echidna's chief claim to fame; it shares with the platypus the distinction of being one of the unique mammalian type, a creature that lays eggs like a reptile and suckles its young. The single egg at first, and later the young, is carried for some time in the pouch. But unlike the young of the marsupials that are also carried in pouches the little echidna is not attached to the teat of the mother. There is none. Instead, the milk is secreted on the surface of the skin of the mammary area, from which it is licked, instead of sucked, by the little one.

In captivity the echidna will take milk, with eggs and finely minced meat, but unless it has a large enclosure with an earth floor in which it can burrow it never settles down, but spends the greater part of its time in efforts to escape. It is immensely strong, and is able to climb well.



To my mind the most beautiful and fascinating of the native animals of the Australian bush are the smaller carnivorous forms, including the native cats and tiger cats of the genus *Dasyurus*.

Most species of native cats are now rare in Australia, for, although they are largely insectivorous and kill, in addition, only small prey, the bushman gives them a reputation as poultry killers that they have not deserved. Accordingly he wages a war of extermination upon them. The Victorian species—the viverrine native cat—is now very rare, and in the whole of Victoria still exists only in three of four restricted areas. Its chief habitat is barren rocky country, where it makes its lairs under boulders and in clefts in the rocks. Like most other marsupials the native cats are nocturnal, so that even in districts where they are still found in numbers they are rarely seen.

The usual breeding months are July and August, and before the young are born the mammary area of the mother undergoes a change and at the same time the pouch becomes enlarged. The viverrine native cat usually has eight little ones about the size of the nail of one's little finger. At birth they are naked and so helpless that they are incapable even of sucking milk from the mother. Thus, they become firmly attached to the nipples and the milk is forced down their throats by muscular action. In their early life the attachment between the mother and baby is so close that sometimes the young cannot easily be separated, giving rise to the belief—widespread in the Australian bush—that marsupials are born in the pouch, attached to the mother.

Within five or six weeks the young grow so rapidly that the pouch can scarcely accommodate them, and before long they merely retain their attachment to the mother by clinging to the source of food supply. At this stage the mother presents a curious sight with four to eight fat, spotted little ones clinging to the under

surface of her body and making navigation difficult.

The viverrine native cat is gregarious, a number often being found in one lair, and although minor conflicts with much hissing and other noises are frequent, they rarely inflict severe injuries upon one another. If handled carelessly, however, they bite readily.

While the native cats have received an undeservedly evil reputation, the big spotted tiger cat is a more formidable animal. In Victoria these animals are found

only in small numbers in the Otway Ranges, but in Tasmania they are still numerous.

Next to the kangaroos and wallabies, by far the best known and the most numerous of Australian animals are the so-called opossums—the silver-gray or bushy-tailed opossum of the open forest country, the mountain opossum, distinguished from the former by the dog-like appearance that it derives from its shorter and rounder ears, and the beautiful little ring-tailed opossums, of which there are many species.

The common gray or silver-gray opossum is found in forest country almost the length and breadth of Australia. Its size is about that of a domestic cat or



THE RARE STRIPED PHALANGER

This curious little mammal is found only in the northeastern corner of tropical Queensland. It is characterized by the length of its central "finger"

slightly smaller and it is strictly nocturnal. During the day the silver-gray opossum sleeps in hollow "spouts" of gum trees, coming forth at dusk to feed on the slender tips of gum trees, leaves and fruit.

The silver-gray opossum is one of the few marsupials that do not disappear with the spread of settlement, and even in the parks and gardens of the City of Melbourne itself it is still to be found breeding. It thrives in captivity and if the young are taken from the mother soon after their bodies are covered with hair and are reared by hand they become very tame, breeding readily in captivity. Only a single young is born each year, and, as with most of the marsupials, the breeding season is in midwinter so that the opening of trapping seasons for these animals has taken heavy toll of their numbers.



THE LESSER FLYING PHALANGER OR "SUGAR SQUIRREL"

In the bush these animals are known as "flying squirrels", creatures that had developed parachutes before many other mammalian forms, with parachute membranes, took to the air

Unlike the silver-gray species, certain species of ring-tailed opossums build nests for themselves. These animals frequent forest gullies and the dense brush that fringes rivers and streams, and in these situations their bulky, domed nests—composed of strips of bark and ferns with the entrance hole in the side—are often to be seen.

The ring-tailed opossums also breed in midwinter, but unlike the silver-gray form, two, or even three little ones are often born at one time. After the little one—called "joey" in the bush—leaves the pouch, and for some weeks before it is able to fend for itself, the mother carries it everywhere on her back where it clings tightly with its teeth as well as its claws.

The common species of ring-tailed opossum in the south of the continent is *Pseudochirus laniginosus*. It is gray in color, or gray, tinged with rusty brown, or rufous, and has a white throat and under surface, and the terminal third of the tail also tipped with white. In captivity the ring-tailed opossum soon becomes tame, and although it is not quite as easy to feed as the gray opossum, it will breed readily if the right food is given.

The jungles of tropical North Queensland are inhabited by many animals unfamiliar even to Australians from the southern parts of the continent. Indeed, the animal life of the far North of Queensland has affinities as much with New Guinea as with Australia. Thus, two distinct species of tree kangaroos are found in these humid jungles—one near Cairns and a second species a little to the northward, on the Bloomfield River just south of Cooktown. The discovery of the boongarry, as this animal was called by the natives of the Atherton Tablelands, was first made by the Swedish Naturalist Carl Lumholtz about 1884.

Although the silver-gray opossum is found even at the extreme north of Cape York Peninsula, in North Queensland, its place is taken in the jungles by a curious

phalanger known popularly as the cuscus. The cuscus is uniform gray in color in the female, but mottled or blotched with white in the male. It has a long prehensile tail, much like that of a ring-tailed opossum, but its most characteristic features are its large eyes, that are bright orange-yellow in color, and the short ears, that are so short as to be almost indiscernible in the dense fur, giving its head a curiously "bullet" appearance. Although the cuscus is said to be savage and morose in disposition, specimens captured during a recent expedition to North Queensland were rather timid and retiring, and when gently handled their confidence could easily be won. In captivity they devoured large quantities of bananas, although in a wild state the animals eat chiefly leaves and native fruits.

Even more bizarre in appearance is the striped phalanger, not much larger than a squirrel, but with jaws so powerful that it readily tore through two thicknesses of galvanised wire netting and made its escape. One species only is found in Australia, the remaining representatives of the genus inhabiting New Guinea.

Among the marsupials a number of very distinct forms have developed flying membranes resembling those of the familiar true flying squirrels, from which their popular names are derived. Of these the lesser flying phalanger is the most numerous and widely distributed. In size it is somewhat smaller than the common gray squirrel, and is of uniform gray tinged with black, and having a black stripe extending from forehead down the middle line of the back. The fur is of a fine silken texture, and the tail is heavily furred, almost bushy. The lesser flying phalanger, or "sugar squirrel", as it is known familiarly in the bush, makes its home in hollow trees or limbs, one of its favorite haunts being a knot hole in a tree. This is often furnished snugly with leaves, chiefly those of gum trees. Not infrequently a large family or colony (Continued on page 189)

MEET THE GRASS FAMILY

By F. LAMSON-SCRIBNER

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This is the first of a group of articles by Dr. Lamson-Scribner, eminent agrostologist, who will introduce us to the characteristics and value of important grasses we see every day but do not recognize.

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THE Grass Family is a large and most interesting family with many distinguished members, some with an ancestry whose origin is recorded in the rocks of remote geologic ages. Wherever flowering plants grow these grasses may be found, from far within the Arctic Circle to all countries around the world in the torrid zone. They are cosmopolitan in their distribution and as varied in their individual characteristics as are the conditions of their environments. They vary from tiny plants of moss-like appearance near the borders of perpetual ice and snow to forest-like growths covering vast timbered areas within the tropics. They clothe the ground with carpets of many shades and varying texture, and hold the earth and drifting sands from erosion by winds and rushing waters. There is no other plant family so closely connected with human interests in supplying essentials for man's very existence, his comforts, and the materials that have assisted his progress and civilization.

There are many members of the grass family of royal and distinguished appearance, many of great charm and rare beauty that minister to man's aesthetic nature by adorning his home or beautifying his surroundings. In such a numerous family one may expect to find a few black sheep and we will not be disappointed here.

A family whose members are of such universal interest invites wide attention and close study. Grasses are not difficult to understand. Study will introduce to us grasses that may become lasting friends, long overlooked. Fifteen hundred species of grasses have been recorded as growing within the United States. On nearly any farm of two hundred to three hundred acres, located in the New England or the Middle States and possessing a wood lot, an average water supply and usual soil conditions, there may be found sixty to a hundred species of grasses. It is really astonishing how these plants of our meadows and woodlands, roadsides, pastures and stream banks will spring into view when once we begin looking for them with seeing eyes.

There are many grass-like plants masquerading and associating with grass royalty, appearing to the untrained eye as one of the family. The Sedge Family is the nearest relative to the grasses, possessing a striking resemblance in



PANICLE OF ORCHARD GRASS

This valued grass is shown here much enlarged. It is an important member of an important Tribe

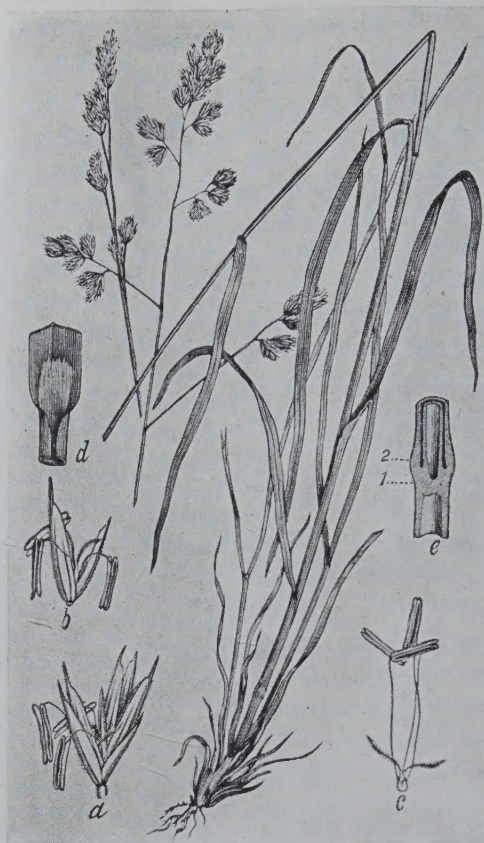
stem and foliage, and, to some extent, in habit also. Like the grasses they are widely distributed, but are generally more limited to wet places. Their solid and usually three-cornered or three-angled stems and ternate leaves, the third leaf standing above the first, are characters that at once serve to distinguish sedges from grasses, distinctions easily noted. There are other technical characters in flowers and seeds that the student will soon discover, which will serve to separate the grasses from their closest allies, but those cited will serve our immediate purpose. When we consider that there are nearly 6000 different grass species the idea that "blood will tell" is indeed wonderful, and it is expressed so simply in the angle of a stem or location of a leaf. On account of the great number of species of grasses it became necessary to segregate those having certain characters in common into natural tribes or subfamilies in order successfully to carry on their scientific study. This has been carefully done by taxonomists experienced in this work. About fifteen such tribes have thus been segregated and are now generally recognized. It was announced by E. Hackel, the famous Austrian agrostologist in his *True Grasses*, that no single tribe, no large

genus of over 50 species, can be definitely characterized. All such attempts are subject to many exceptions.

A profound study of the ecology and evolution of these tribes has resulted in practically a complete turnabout in their sequence from the arrangement in the older manuals to those in recent publications. Now the Family ranges from the bamboos, these being regarded the earliest and most primitive type, to the *Maydeae* that includes maize or Indian corn, the most complex and most recently developed species. In a series of articles to follow this, one or more members in each tribe will be reviewed, making clear the principles of classification, the various parts of the grass plant, their modifications, and relations to the functions they perform.

Scattered throughout this Royal Family are many distinguished individuals that because of their economic value possess an importance that cannot be overestimated, an importance greater than that of all other plants combined. These are the cereal grains—wheat, rye, barley, oats, rice, millet and Indian corn, all true grasses that, in one form or another, supply the staple foods of all civilized nations. Our pastures and meadows are filled with grasses for feeding animals that furnish man his beef and mutton, and numberless animal products.

Reference has already been made to grasses of horticultural interest. There are others that supply paper material, and are used in the manufacture of leather substitutes. In the Orient are species of oil-producing grasses yielding valued perfumes, and, to the natives of Southern Asia and other tropical countries, forests of bamboos supply material for house construction, bridge building and a thousand items for household and domestic uses. In these regions rice and bamboos seem to meet every human need and by commercial activities they are carried to every part of the world. Thus do grasses play important rôles.



DETAIL OF ORCHARD GRASS

(a) A three-flowered spikelet partly expanded showing stamens and pistils. (b) Single floret. (c) Stamens and pistils and minute lodicules at base. (d) Ligule at base of leaf-blade where it joins the leaf-sheath. (e) Section of one of the nodes, showing swollen base of leaf-sheath and septum that closes the hollow stems at the nodes

In order that we may, when we see the different grasses, appreciate their value and interest, we will introduce certain outstanding members of the Family. Let us start, as a part of this article, with Orchard Grass, *Dactylis glomerata*, a member of the Tribe Festuceae. This is one of the best known and most valued grasses in this Tribe. The genus *Festuca* numbers nearly one hundred species, among which are many valued for forage, hay and in lawn mixtures. The spikelets are usually two to many-flowered and arranged in panicles or racemes. The Tribe as a whole embraces about eight hundred species, including the most important grasses of the temperate zones and high mountains in the tropics.

Orchard-grass, or cock's-foot, in England, is a native of Europe, temperate Asia and Northern Africa. It is now widely distributed throughout the temperate regions of the world and is everywhere highly valued both for hay and pasturage. It is distinctly a "bunch" grass, growing in strong vigorous tufts producing, in early spring and summer,

an abundance of long, flat deep bluish-green succulent leaves keeled below, and tender shoots. The stems are from two to four feet high with terminal panicles three to eight inches long with a few rather rigid branches that, during the blooming period, are widely spreading but after flowering become erect and closely appressed to the main axis of the stem. The spikelets are three- to five-flowered, crowded at the ends of the branches in dense one-sided clusters or glomerules, as shown in the illustration. Owing to its bunch-like habit of growth orchard grass is not used in making lawns, but it is unrivalled for pastures when mixed with English foxtail or Kentucky blue grass, the June grass of New England. Variety *variegata* has leaves striped with longitudinal silvery white bands, and is sometimes cultivated as an ornamental. It is thus able to represent its family as a foliage plant.

Archibald Rutledge, whose delightful story in the July issue of Nature Magazine brought such a ready response from our readers, will be among those present in the October issue. Mr. Rutledge is in the front rank of our writers on Nature, and combines a beautiful philosophy with his deep and understanding knowledge of the wild. His charm of style makes the reading of his stories a delight, but when the reader has finished he finds that he is left with more than mere enjoyment in the facile use of words, or even new knowledge of the wild.

Nature Makes an Enchanted Isle

By RUTH INGRAHAM

THE garden pool, purposely planned to invite the smallest of birds for a bath, was shallow at the outer edge, deepening gradually toward the back, where there was a sump of safe depth. There the goldfish could retire when the neighbors' cat became too much interested in their activities. But it was a long distance from the edge to this rocky retreat—long, at least, for the fussy little fantails. So we established a safety station about halfway across the pool, by placing a large stone on a firm base of three small flat ones. The fishes could take refuge beneath this island, in case of sudden alarm, and they enjoyed its shade during the heat of a summer day.

We little knew what a delightful playground for fairy fancies we were establishing when we put this rather plain and uninteresting stone in position. But Nature saw its possibilities, and bit by bit she wrought a gracious miracle.

First, patches of bright green moss began to appear in the depressions upon the rock's surface. Then we noticed minute plants taking root in these tiny meadows. As they developed, we saw that the reeds and rushes about the pool had scattered their seeds and were being reproduced in miniature in this scant soil almost incredibly formed by the moss, the dust that it caught and held there, and the slight disintegration of the stone itself.

One day a tiny tree started bravely to grow at one side of the island, clinging to the exposed surface with lacy roots that presently reached water—and then how it shot upward! It proved to be a willow, and we had, reluctantly, to snip its ambitious little top off with the scissors in order to keep it in proportion to the rest.

By the time the annual local flower show was due, the little island was a bower of verdant beauty. We carefully lifted it into a stout baking pan, filling in about the base with ground ivy, to conceal the humble carrier. And this miniature garden-that-just-happened took a blue ribbon!

Coming back in the pride and glory of such unlooked for recognition, the fairyland garden continued to grow; and we became emboldened to assist Nature by planting a maidenhair fern in one of the ravines, where it proceeded to flourish unbelievably. Wee umbrella plants, coming to a head, formed the perfect imitation of a palmetto grove; and we could not resist (though we don't care very much for artificial touches in a garden) placing a tiny Japanese toy hut in this setting. We found that by judicious trim-



THE TINY GARDEN THAT JUST HAPPENED

How Nature herself planted and fashioned a fairy islet in the garden pool and won a prize

ming of roots that were ever reaching downward into the pool, the growth of the plants could be controlled so as to keep their fairy-like proportions. This was discovered through the tragic mistake of cropping the willow roots—floating out in long streamers through the water—too severely, whereupon the little tree became a dry stick, bare as a flag pole. But it made such a splendid mooring mast for the dragon flies that we left it a long while after this occurred.

Sometimes we have found the Japanese hut upside down at the bottom of the pool, and this has given rise to the theory that maybe, after all, the island is of volcanic origin, and subject to thrilling little earthquakes, all its own. But again, a large toad has been discovered in deep meditation, upon the site of the submerged cabin. And somebody once saw a pussycat sitting serenely on top of the entire landscape, dipping her paws daintily into the water. There may be other reasons.

Bit by 'bit the little island's dimensions are being reduced, and its form altered through disintegration. Now it is discovered that the network of roots put down by the valiant little tree has come tremendously to life. We may have to set the embryo forest in some moist, woody spot and begin all over again with a big bare stone set upon three little flat stones. After all, how wonderful to watch it become an enchanted isle!

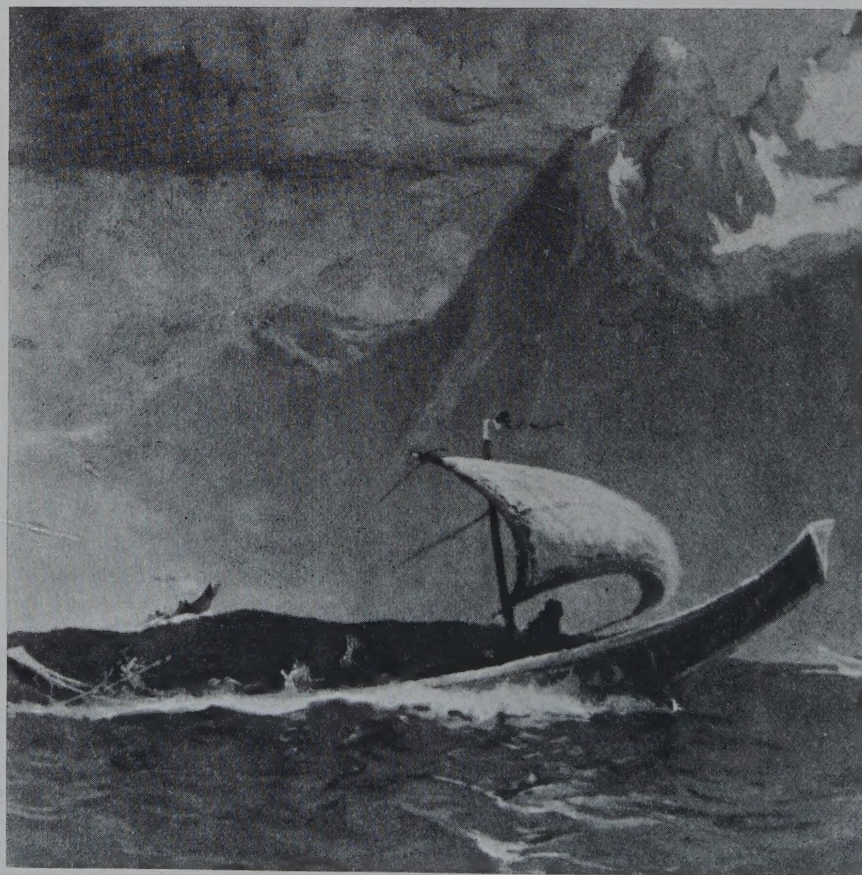


Our National Scenery in Travel Poster

By
PATTEN BEARD

*Photographs by
Clifford Schofield*

ALL those who enjoy Nature and the outdoors should look for our new travel posters. Inspired by our vast natural beauties, these posters surpass many of the famous European travel posters seen abroad. For many years, France, Switzerland, Italy and England have led the world in travel posters that are outstanding for their great beauty. Returning travelers have talked of them and brought them back to frame and hang on their home walls. Occasionally, in going past windows of a foreign tourist bureau, we stop to look again at an Old World castle, or a Swiss highway, or picturesque sails on Lake Geneva, or colorful Venice or Siena interpreted with breadth and simplicity of line that make the charm of the true poster art. But it is comparatively recently that we in the United States have taken Nature as our own special inspiration for national travel posters, and have given to our leading artists this superb theme on which to exert their talents.



The grandeur of rugged peaks is caught by color photography in the Union Pacific's poster of Dream Lake, Rocky Mountain National Park, while at the left the Northern Pacific's artist has captured an Alaskan scene.

Our American scenery is often on so grand a scale that artists should have brushes of comets' hair and the seven-leagued canvas of which Kipling sings to paint the things as they are seen. For Nature, the greatest creative artist, has made these wonders of colored sculptures, rocky granite mountains and glaciers like no others in the world for size. Nature, the great painter, has colored the Yellowstone and blued the crater of a sunken volcano-lake. Nature has made Old Faithful, the greatest of natural fountains, rise in rainbow glory, and has given us magnificent playgrounds in the cathedral grandeur of the sequoias! To be able to place these on travel posters is indeed art.

The Northern Pacific Railroad's travel posters show the wideness and variety of our Northwest. Whether it be Montana's Rockies, Yellowstone Falls, or Mount St. Helens reflected in an amethyst lake; whether it be the great plains or the grace of geyser, its artists have caught the soul of Nature itself and placed it upon limited canvas to create within us the desire to travel; to see the work of Nature's own artist hand.

Some of this new work of representing our national scenery on travel posters is done with oils and canvas; some with watercolor; some has recourse to color photography. This last medium follows Nature as closely as it can. More than this it cannot do even though its best is amazingly beautiful. It is our painters who have been able to catch not only the scene but the mood of the visitor.

In the poster of Old Faithful the

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Violet and purple prevail in this effective Northern Pacific poster of travel in the Montana Rockies, the powerful engine taking a train to such glorious scenes as that at the right with Mt. St. Helens' blue lake.



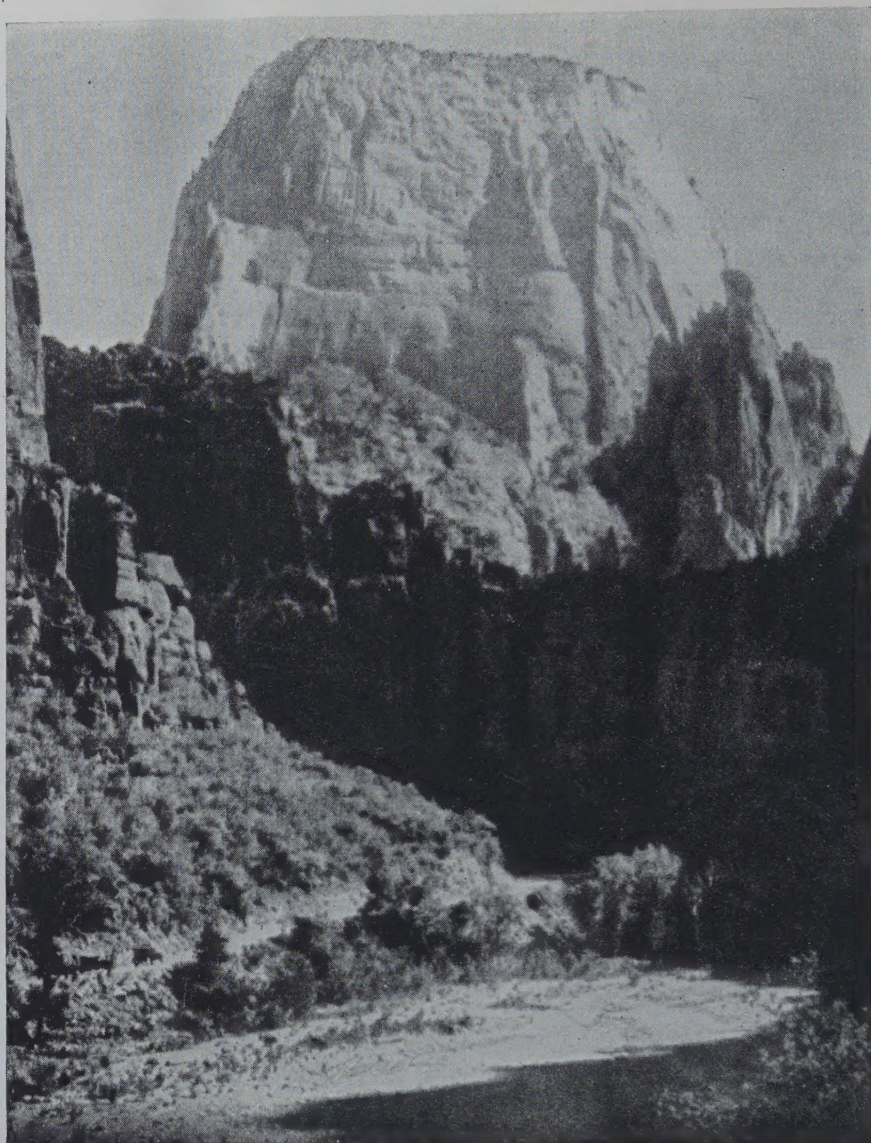
artist's ability has caught the movement of the geyser, reproduced its rainbow colors, and indicated its size, its grace and elemental wonderment.

The poster of Alaska is interpreted in great breadth of horizon with sweep of blue waters and its craglike snow peaks. Mount St. Helens gives the camper's heart a quick response to jeweled reflections framed between fir-boughs; snowclad volcanic heights mirrored in crystal lakes.

In looking over these posters, one is impressed with the variety of our National Park landscapes. One feels that one has discovered something delightfully American and New World that is satisfying to all lovers of Nature.

It seems more than fitting that our artists should devote their talents to art in this distinctly democratic form for those who must hurry along crowded thoroughfares in the midst of city bustle and noise. To each of us as we pass along city streets, the travel poster of this new type gives a quick glimpse of the beauty of Nature. There is refreshment in this glance into the great outdoors that comes like a breath of wind that has passed over mountains to give us strength and renewed youthful vigor. We, too, must go—we, too, must see—must enjoy the charm and beauty of all!

But meanwhile, in months when one is held from doing what one might like best in the way of outdoor recreation, let the American travel poster enter the home of all who are Nature lovers! Seek it and find it and enjoy it till your real dream comes true and you can really, *really go!*



The Great White Throne in Zion National Park has been widely photographed but is glorious again in this Union Pacific poster done by natural color photography

Those who enjoy hobbies may collect these posters, and nothing, I believe, could be a more fascinating pursuit for leisure than to do so—unless, of course the real thing of collecting memories and experiences and joys that come with visiting each and every glorious wonder is ours in this New World.

In the October issue of Nature Magazine we will present a new department designed to be specially useful in applying the magazine to school use. Many teachers now find Nature Magazine a valuable aid in teaching Nature Study and Science. Many others would do so with the assistance of some specific suggestions and guides to such use. This will be provided each month in the new feature written by Esther Scott, Chief of the Nature Study Corps in the Washington, D. C., schools. Miss Scott has had a varied and intensive experience in the Nature Study field, and has made the work in the schools of the National Capital outstanding among school systems. However, in undertaking this section, Miss Scott will welcome the frank reactions of other teachers to the department, and will particularly appreciate any suggestions or criticisms that they may care to make.

"The old elm at dawn, the roof-tree,
 sheafy-topped,
 Brooding out there in the unfolding
 light;
 Its broad breast gently heaving,
 Its graceful arms lifted and noiseless-
 ly waving,
 Its slender fingers beckoning to me:
 'Come,' it whispers, 'come;
 'The evening road is for the old,
 'It leads away into the night;
 'The morning fields are for the young,
 'The dewy, trackless, buttercup
 meadows,
 'And the high wild pastures.'"

W. W. CHRISTMAN



Nature's Poet Laureate

By RAYMOND TIFFT FULLER

WHEN in 1934 the annual John Burroughs Medal for the best piece of Nature writing in prose or poetry was conferred upon William W. Christman, because of his book of poems *Wild Pasture Pine*, the group of distinguished judges highly and fittingly honored an extraordinary man.

Today at 70 he is tilling the stony soil of the New York farm where he was born; where his uneducated parents had spent half their lives; the farm which has always been his home. From it as a boy he walked a mile to a one-room district-school in which he received, during parts of three winters, his only formal schooling. On it he and his good wife have reared nine children. On it and roundabout it he has been a lifelong keen observer of Nature, her ways and wonders.

For Farmer Christman, the serious writing of poetry began at 58! *Wild Pasture Pine* is the third volume of verse published since; a fourth is in preparation. Here is a man who for half a century had been pondering the meanings of life, absorbing the beauty of that particular world in which he moved; until at length he became articulate; became able to communicate to such as you and me some part of what he felt and discerned. Then, when more than sixty-five, he suddenly becomes "accepted" by virtually a whole generation of today's young poets. If you happen to be at all aware of the newest spirit moving amongst young American poets; their seemingly militant captiousness and earnestness; of the sharp demands arising from their spiritual and technical criteria; you must be amazed that Christman has won approval as an authentic brother of these selfconscious moderns. It is so. The inspired patriarch's verse has actually been appearing in not a few of those little poetry magazines everywhere springing up with the present renaissance in

poetic fervor. Surely here is paradox! Perhaps four of the qualities of his writing partly explain this approval—a directly stated simplicity of thought; an ear for original rhyme-sounds; a strikingly rich vocabulary; yet an equally striking restraint in the use of far-fetched words except where they somehow exactly fit.

But these qualities do not at all explain the poet. How shall we account for this unique person? We shall not. The pedigree of Pegasus has not yet been entered in any official stud-book. How that winged steed may be harnessed, even by a horny-handed plowman, to plow Parnassus, we do not know. We are not sure whether poets are born or made. The meagre "larnin'" from three winters of primary school; a marriage at 22; the responsibilities of a large family which has meant fifty years of struggle and toil on "the untillable acres" (as he calls them); few, if any, personal contacts with stimulating minds; practically no traveling about. Would this not seem infertile humus from which poetic genius might spring? Yet, out of such soil, directly, simply, his has sprung. And humbly:

"Let my poor songs in even measure flow;
 Not upward to a glorious climax rush
 Till I have learned the golden arpeggio
 And evening voluntary of the thrush."

It appears that from early youth this farmer boy's soul harbored two—shall we say literary?—aspirations: one was a timid yearning to express himself; to write about what he liked and thought; the other was a passion for good reading. "At thirteen," he says, "I was reading what Shakespeare and Dickens I could find." A little later (as here and there he was able to borrow the books) he delved into most of the classic English essayists, novelists and poets. Always he remembered what he had read with

such comparative difficulty. Burroughs' writings he loved. Presently, in deference and with great temerity, he began to correspond with Burroughs; the latter freely answered his letters and later made references in his books to some of their contents. When Christman was between forty and fifty, now father of a big family, with some labor he succeeded in putting down many of his first-hand observations in essay form so attractively that the articles were printed in outdoor magazines. Thompson Seton quoted several pages from these essays, and Burroughs commented that his fox stories were "valuable natural history". This farm-hand and day-laborer, this father-farm-owner-naturalist, had come to have a little confidence in his use of pen and ink. His never-satiated native curiosity was finding literary outlet.

About this period also he began a long agitation in Schenectady County, where he lives, for the consolidation of rural schools (in this Christman was a pioneer) and the improvement of their standards. He and his wife had a passion for bettering the educational facilities with which their sons and daughters were now in contact. He has written much in local and surrounding newspapers on this subject; indefatigably he talked "in meeting" and out; and he will tell you, "to this day I have not lived down the resulting unpopularity among my neighbors who resented spending their money for mere learning". Denied secondary education themselves, he and his

wife succeeded in putting all nine children through the distant high school. Then, at last, came poetry: his life-work has eased, his children were grown.

Of late years his poems are often appearing in most unexpected places. And now and then he publishes prose. In *NATURE MAGAZINE* for March, 1926, you will find a typical specimen on the curious freaks of winter weather along his Bozenkill Creek.

Let us look at him face to face. At a distance he is the garden-variety of farmer—just another citizen in workaday clothes. Approach this slender, wiry figure and extend a hand in greeting: look once into those sparkling dark eyes, deep-set under heavy brows, into that lined, tanned, sensitive face; receive one flashing kindly smile. Words from him are unnecessary to reveal to you the rare quality, the quiet charm of an unusual personality; a man who is hale, almost young, at 70. His black hair begins to show a few streaks; but he is no "good gray poet". He is "the old elm at dawn. . . ."

"One of Nature's noblemen"—you have heard that title applied more or less appropriately to many another. Well, here, carved on William Christman's weather-beaten lintel and doorstep, belongs that inscription. There his friends and readers have already traced the letters; the award given by the Burroughs Memorial Association has but chiseled them deeper. There they will stay, perchance as long as the Untillable Acres he has so fruitfully tilled.

A Doubly Floriferous Showy Orchis *By* BESSIE L. PUTNAM

STANDARD botanies describe the showy orchis as having a single flower scape. Gray states that the flowers it contains are "few"; Wood says, three to five; Britton, three to six; and House in his mammoth book on wild flowers, three to ten. This twin scape, the one part with seven and the other with nine flowers, quite transcends any of these reports, with a total of sixteen flowers from a single root. It stresses the point that one is never safe in making an unqualified statement of

certain facts in Nature; there is the possibility that their authenticity will be challenged by Nature herself. We can only wonder if this freak in the hands of a Burbank might not give rise to a new strain with more and larger spikes.



A RECORD SHOWY ORCHIS

It bears seven flowers on one stem, nine on another, both from the same root

COURTESY AMERICAN MUSEUM OF NATURAL HISTORY

likes shade and the neutral or slightly acid leaf mold of deciduous woods. Roots purchased from the professional grower are better fitted to stand transplanting than those taken directly from the woodland haunts of the plant.

This earliest of our native orchids is now rare or almost extinct in many places where its pleasing fragrance once permeated the woods. If tempted to pick the lovely lavender or pink and white blossoms—which I hope you will not be—at least spare the two shining green leaves, the only ones the plant can grow during the season; they are needed to help in maturing the root growth. Perhaps, unless its haunts are remote from the so-called "lovers of Nature", its safest place is in cultivation. It

Maury's Work Goes On

By CHARLES FITZHUGH TALMAN

IN RICHMOND, Virginia, stands a noble monument to one of the most remarkable men who ever wore the uniform of the United States Navy—an officer no less famous than Lawrence or Decatur, Farragut or Dewey, though he never took part in a battle. His immortal victories were those of peace, which are no less renowned than those of war.

Matthew Fontaine Maury was born on a farm near Fredericksburg, Virginia, in 1806, and joined the Navy as a midshipman at the age of nineteen. During his long voyages he became impressed with the meagerness of the information then available to mariners concerning the prevailing winds and currents of the ocean, which favor or retard the progress of ships under sail.

It is a mistake to suppose, as some of Maury's eulogists apparently do, that such information was entirely lacking until Maury supplied it. The Greek sailors of antiquity learned how to utilize the etesians—the northerly summer winds of the Aegean Sea—and the monsoons, which, changing their direction twice a year, make easy sailing to India and return. After the fifteenth century of our



MATTHEW FONTAINE MAURY

The greatest although not the only Pathfinder of the Seas. From a painting by Hergesheimer at the U. S. Naval Academy



COURTESY D. PARSON, R. N. R.

OCEAN WEATHER CHARTED ON THE OCEAN

Chart of North Atlantic weather, drawn from radio reports, posted daily in the chart room of the "Duchess of York"

era the trade winds of the Atlantic and Pacific began to be similarly turned to account.

The astronomer Halley charted the ocean winds over the whole intertropical region of the globe in 1688, though he could have had but a scanty fund of data for the purpose. Benjamin Franklin produced a creditable map of the Gulf Stream in 1770. Captain James Horsburgh published in 1809-11 very full accounts of the winds on the Eastern sea routes.

Maury had his precursors, but the same may be said of nearly every famous pioneer. Minor anticipations of his work do not diminish its merit. Though he was not the first or the only "pathfinder of the seas," he was by far the greatest one.

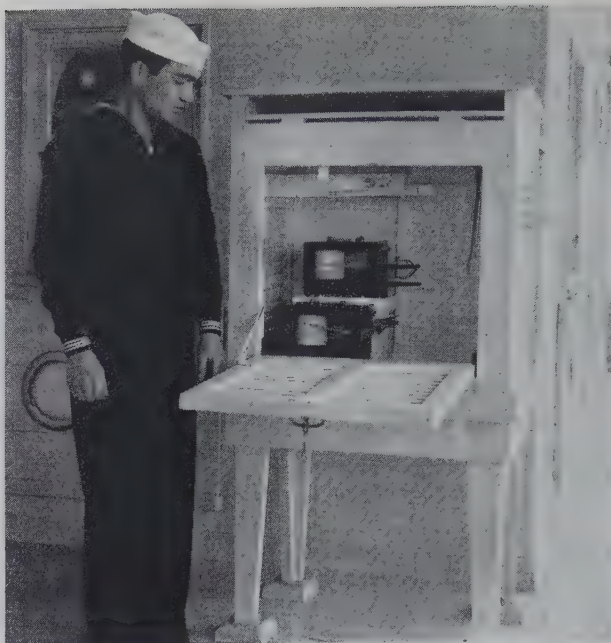
After a stage-coach accident had incapacitated him for service afloat, the young officer was placed, in 1842, in charge of the Depot of Charts and Instruments; from which subsequently developed the Hydrographic Office and the Naval Observatory, and from which, still later, the Weather Bureau inherited the task of collecting marine weather statistics. Here he embarked upon his fruitful task of surveying the meteorology of the ocean.

He found stored at his office a quantity of old log-books of naval vessels, from which he was able to extract enough information to form the basis of his first Wind and Current Chart, issued in 1847. About five thousand copies of this chart, which related to the North Atlantic, were soon placed in the hands of shipmasters, and though based on far less numerous records than were later publications of similar character it proved amaz-

ingly useful. Long voyages were shortened by days and weeks through its use. The average time required to sail from New York to Rio de Janeiro was cut in half. "It was," says one of Maury's biographers, "as if a friendly wizard in seven-league boots had suddenly risen out of the waves to lead merchant vessels by the shortest and quickest paths."

A majority of the skip-pers who made use of this map heeded Maury's request to send him logs of winds and weather, filled out according to his directions, and by 1851 fully a thousand volunteers, far and near on all the oceans, were taking observations and sending him their records. A long series of charts appeared, as well as accompanying volumes of text, relating to winds, currents and other matters of practical interest to sailors, including the average frequency of rain, fog and thunderstorms in different areas, the temperature of the sea and the locations of profitable whaling grounds. Eventually 200,000 copies of these charts, besides 20,000 copies of sailing directions in book form, were distributed gratuitously to mariners who co-operated in collecting information. All seafaring nations profited by these publications. The annual saving to British shipping alone was estimated at ten million dollars.

In 1853, at the suggestion of the United States Government, an international conference met at Brussels and plans were adopted for enlisting sailors of all nationalities in a vast campaign of observations according to Maury's methods. In peace and war the observations were to be carried on, and in case any of the vessels on which they were conducted should be captured, the meteorological log was to be held sacred. The work thus inaugurated has continued ever since, but its scope has greatly broadened, as might be expected, since Maury's day.



PHOTOGRAPH FROM THE U. S. NAVY

A SHIPBOARD WEATHER STATION

This sea-going weather station is installed on the bridge of the U. S. S. "Wright"

He conceived of it primarily as a means of aiding mariners in laying their courses through placing at their disposal a knowledge of the average conditions of past years; in other words, climatic data. Today, however, a considerable proportion of the ship-board observers whose records are utilized in compiling these averages report the results of each observation promptly by radio to a meteorological establishment on land. The radio reports, assembled and interchanged between the collecting centres, provide data for drawing weather maps, which are the basis of forecasting the weather of both land and

sea. Weather forecasts and storm warnings broadcast over the oceans furnish navigators with a type of information of which, though it grew out of his work, Maury never dreamed.

Neither did he foresee that a vast system of observations taken on board ships would provide indispensable safeguards for the navigation of the air. Transocean flying routes are now being planned in the light of the knowledge supplied by three generations of marine weather observers, and the new system of radio weather reports from ships is destined to become even more valuable to the men who travel by air than to those who sail the seas.

Millions of daily shipboard weather records are now on file at the headquarters of the Weather Bureau in Washington and millions more at similar institutions abroad. But for their existence, the oceans, which cover a much larger area than the lands, would be blank on our charts of climate. Without them, meteorologists would be obliged to piece out with their imagination the facts about the general circulation of the atmosphere, which constitutes the framework of world weather.

Charles Fitzhugh Talman will give us another of his interesting stories of the weather in the October issue of *Nature Magazine*, discussing what the upper air means to the weatherman, both now and in the future. Edmund J. Sawyer, ornithologist and artist, draws and writes about the attitudes of birds, giving us a new and fascinating approach to bird acquaintanceship. In an attractively "different" article Herbert Beal elevates the lowly mollusk to a position few realize it possesses, that of inspiration to great artists even in the early days of art in Egypt and in Greece. Dr. F. Lamson-Scribner introduces some of the royalty of the Grass Family in an article that enables the reader better to appreciate the beauty and the value of grasses we usually accept as a matter of course.

Goldie, A Chinese Oriole

By H. W. HUBBARD

PERHAPS Goldie, brought up by her own feathered family, might have grown larger or flown sooner, but it is hard for us to believe that she could have been happier than she was, brought up by the Hubbard family. Certainly to no member of the bird family could she have brought the exquisite delight, the whole-souled satisfaction that she brought this human tribe of bird lovers.

Goldie came to us early one July morning, a wretched, frightened, featherless bird in the hands of a Chinese boy.

"Mother, we want to keep the little bird. See how it nestles in my hands." Our youngest had taken the tiny bird from the hand of her Chinese friend and had left a few pennies in its place. So Goldie became ours.

"How shall we feed it?" "What shall we feed it?" The family council was full of zeal. Father consulted his bird book and mother told exactly how human babies should be fed. But the young members of our family had watched some redstarts being fed and reared at the edge of our porch so they had their ideas also. After considerable discussion, it was decided to feed her from daylight to dark every half hour; each member taking his turn. The privilege of feeding her the first four hours of daylight was assigned to Ward. He thought that an alarm clock would be necessary but after a few days Goldie would awaken him by pecking on his cheek or by pulling his hair.

At first we fed her bread soaked in water and bits of fruit, then soon added worms to her diet. Cockroaches and flies and crickets suddenly assumed a real value as Ward daily searched the camp for such pests and put them in Goldie's tin pan ever ready for her use.

By the end of the first week the clock was no longer used to tell her feeding hour. Every half hour she came to her perch on the west porch and made an impatient, funny squeak. She was never kept in a cage and had the liberty of the house and garden. Our family lived and slept out of

GOLDIE HAS HER LUNCH

Poised on a friendly finger, she opens her bill wide for food



doors though we ate in the house. Goldie was always at home and never had any interest in the rest of the feathered tribe on the mountain. She was devoted to all

the Hubbards but seemed to allow Ward a few more privileges than the rest. Guests might feed her but only to one of the family would she come contentedly to nestle in his hair or to perch on his shoulder. Any one of us could call her and she would come and accompany him on the walk that he was taking. In fact it was hard to go on a long walk without Goldie accompanying us. If any one of us wanted to go on an extended tramp and feared Goldie might fall prey to a hungry hawk he would call someone to keep Goldie at the house until he had been gone at least five minutes.

She seemed to know the time for milk to be carried to neighboring houses and would be ready to accompany the child who took it. The neighbor might for a moment, by feeding, delay the oriole, but it would be only for a moment. With a cry Goldie would soon be flying around the head of her small companion or resting on his head or shoulder.

When the orioles left the mountains for warmer regions Goldie seemed unconcerned. She never claimed any relationship to her feathered family.

When we left our mountain camp in the middle of August the orioles on the plain were still in abundance. For the train trip Goldie had to be put



GOLDIE ON A HUMAN PERCH

And, also on a perch that seems more natural to a bird



in a cage, but once at home she was again set at liberty. However, she never quite forgave us for that one indignity. Perhaps it was that now, at the age of four weeks, she was not at all dependent on us for her food, or perhaps life in civilization had taught her fear. At least now at times she refused to come when she was called. Generally we could pick her off the porch rail or Ward could climb up the ladder and gently pick her off the bough of the tree. But we noticed that she chose higher and higher boughs and more and more neglected the meal times that we set for her. Sometimes when we called her she would begin vociferously to peck at leaves or bugs in the bark of the tree, as though she were conscious of her feeding time but was showing us how grownup she was and able to get her own food.

One Sunday there were guests who were eager to see Goldie. We called. No answer. We waited. At last a flash of yellow. Ward climbed the tree on which she had

alighted. He put his hand out to her. She was gone. Again we called her, disturbed at her coldness. Again she came and lighted on the roof. Ward coaxed her to jump on a stick that he held and with which he was just able to reach her from the top of the ladder. She played with his affections some time, but at last hopped to his cane and let him bring her down to the expectant crowd. We kept her longer than usual admiring her colors, her graceful beauty. Then she accompanied us to the gate with the guests.

"Good bye," we called to our visitors. "Good bye," they called in return. At this Goldie, with a gentle chirp, extended her wings and soared upward to the southeast. We little thought we were saying good bye to our fond friend. We watched her tenderly for a moment. Then the green leaves hid her from us. She was gone. She never again answered to our calls. She probably joined some other members of her own feathered family.

A Life-Saving Thistle

By GEORGE T. HASTINGS

THOUSANDS of visitors to the Yellowstone Park have undoubtedly noticed silvery green thistles in the meadows near Yellowstone Lake or in other parts of the Park. From one to three feet tall, the leaves and stems are covered with soft hairs that shine in the sunlight, making the plant one of the most attractive of the many that fill the meadows or border the roads. The purple or lilac flower heads are close against the stalk near the top, largely hidden between the leaves. A question to one of the ranger naturalists, authorities on all phases of Nature, brought the answer that the plant was the leafy thistle, *Cnicus foliosus*, in the Park commonly called Everts' thistle.

The story of Truman C. Everts is recorded in the diary of the Washburn Expedition of 1870 to the Yellowstone, the exploration that resulted in the region being set aside as the first of our national parks. Everts, himself, tells of his experiences in an article entitled, "Thirty-seven Days of Peril," published in *Scribner's* for November, 1871. On September 9, 1870, the small party of explorers, with their guides, were making their way through the forest near Yellowstone Lake when Everts, attempting to find an easier way through a tangle of fallen trees, became separated from the others. He pushed on till dark, then tied his horse to a tree and lay down to sleep. Early in the morning he started on, expecting to find the others.

Dismounting in an opening in the woods to look for signs of the party, his horse became frightened and ran away with all his equipment fastened to the saddle. Everts was left with nothing except what he was wearing and a knife and small spy glass in his pockets. Failing to catch the horse he set out to find the party, but became bewildered and took exactly the wrong direction. For several days he had no food, then, in his own words, "My attention was attracted by a small green plant of so lively a hue as to form a striking contrast with the



deep pine foliage. For close examination I pulled up the root which was long and tapering, not unlike a radish. It was a thistle. I tasted it, it was palatable and nutritious. Eureka! I had found food." For the thirty-seven days he wandered in the forest, thistle roots boiled in a hot spring were his only food, except one small bird he caught in his hands, two minnows and a sea gull's wing he found on the shore of the lake. When he moved from place to place he carried a supply of the roots. When found he was in a region where there were no thistles and was nearly exhausted from hunger and hardship.



Trees of timberline have about them a charm born of their constant battle for life. Tortured by the almost continuous winds, they struggle from birth, their roots valiantly gripping such soil as they can find, their bent and misshapen forms racked by the elements. At an altitude of some seven thousand feet, the cembra pine above stands out as a lonely sentinel above the pastures of the Upper Engadine in Switzerland. At the right is a timberline tree of our own Colorado Rockies, gnarled and twisted, but with its valiant roots holding tight to the scant soil in the rock crevices.





As valuable friends of the gardener, most little ladybird beetles should be invited to stay around and not fly away home to investigate the rumor of a conflagration. Rather, they should stay and feed upon the aphids. Above is a friendly ladybird and her hatching eggs. Three of the larva are out and ready to go to work on the plant lice. At the left we see a mother ladybird, her pupa case and a larva of the species. The latter are small, flattened grubs of a blue-black color, spotted with yellow or red and equipped with six legs near the forepart of the body. Their appetites for aphids or plant lice is enormous. In fact, in California, ladybird beetles are sold by the quart and turned loose in an orchard to eat the woolly aphids that infests peach trees. Photographs by Cornelia Clarke.



Among the Rodents

In the majority, tiny, elusive and often destructive, the species of rodents are many and varied. Some live in a dark den within the walls of the barn, some burrow in desert or field, some build houses in the water. Although regarded generally as pests, and, actually, constituting economic nuisances, even the rats and mice are interesting, and by no means merit the usual repugnance toward them all.

There is, for example, the entertaining little kangaroo rat, above, caught in unconventional pose by Lorene Squire. This interesting little long-tailed jumper is a citizen of the Southwest, getting his name from its kangaroo-like method of progression. It is one of the handsomest of our rodents, and not at all rat-like. They live in colonies and make elaborate burrows.

We do not much like to have about the little house mouse, at the right, the most common and democratic of the mammals. Nothing is sacred to it, and it breeds so many families, with five to ten members in each, that man is likely to be in continual warfare with this tiny pest.

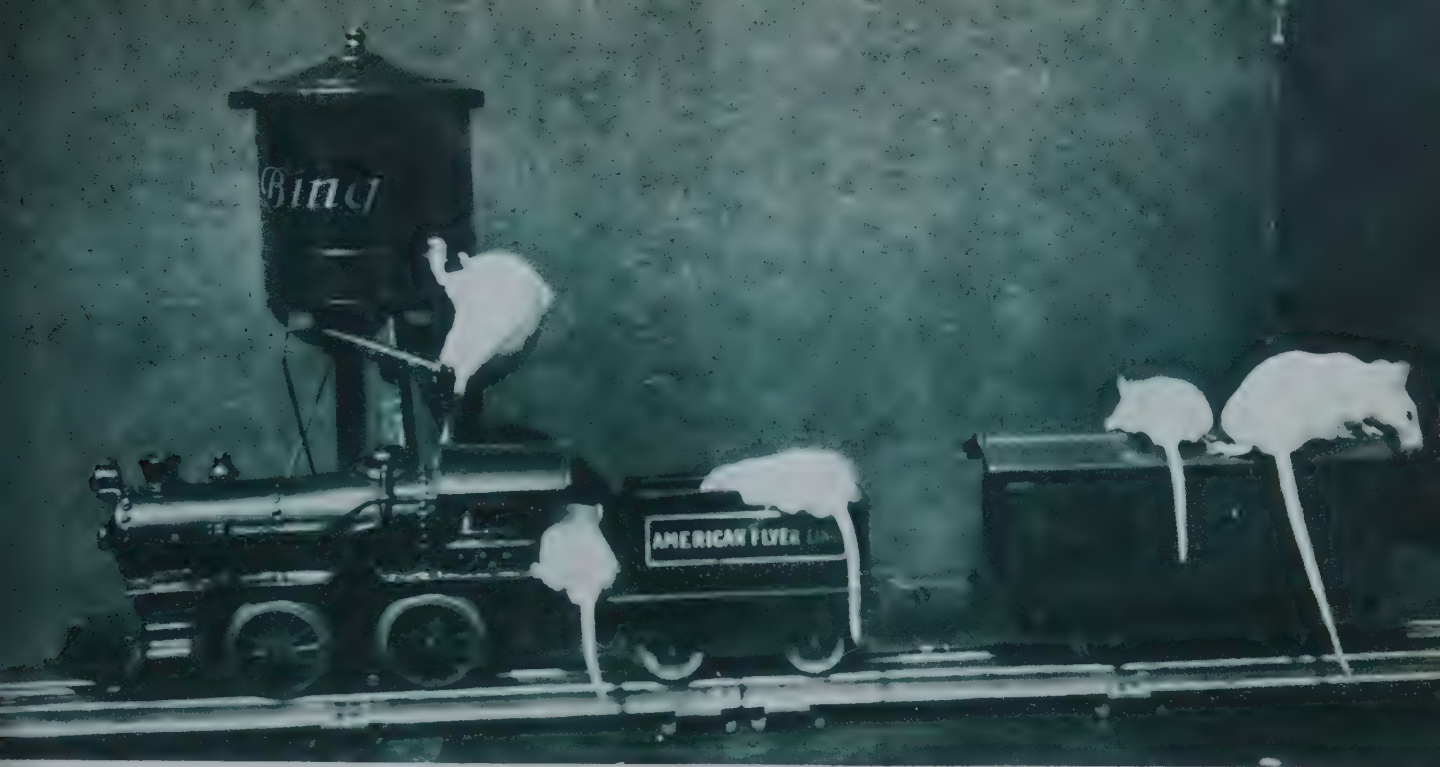




At the left is a meadow mouse, among the most abundant of our small rodents, with more than seventy species distributed over the country. They are adapted to all sorts and conditions of environment, are agricultural nuisances, and the more hawks and owls we have to keep them in check the better. Above is a little Japanese waltzing mouse, a pet distinguished by a crazy habit of going round and round in circles with a sort of waltzing movement.



Above, at the left, is the white-footed or deer mouse, and, directly above, a mother with her young. The life history of these little rodents is a fascinating study. Some of these mice of the woods and fields make complicated, maze-like burrows for use both in search for food and for escape. At the left, a barn rat inspects its nest full of young.



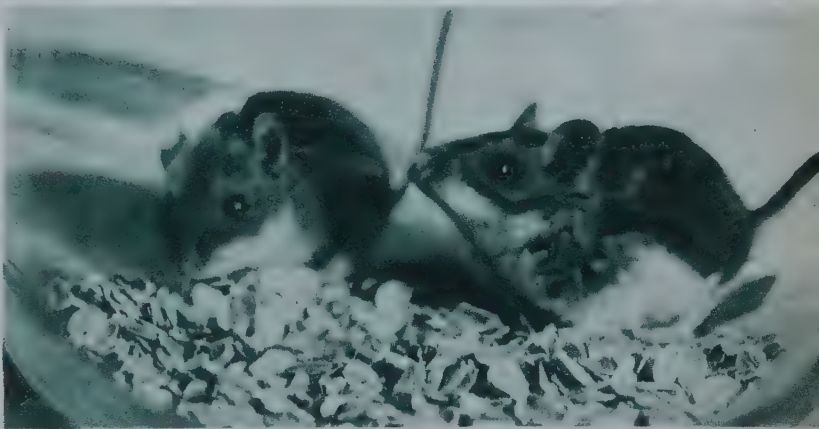
White mice are best known as pets to the average individual, but they have served notably in connection with medical research. Above we appear to have a white mice holdup on the railroad—five rodent Jesse Jameses.

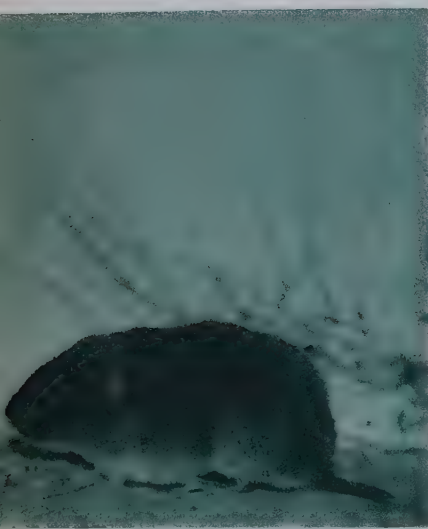
At the right are two white-footed mice of the prairie region. This mouse, of whatever species, is a handsome little fellow, clean, graceful and agile. They easily become pets. In the wild they make comfortable nests, sometimes beneath stumps, but often in bushes, four feet above the ground.

The surprised-looking little fellow perched on the hand at the right, below, is a pack rat, famous for its habit of gathering up all sorts of things and carrying them away to its nest.

Below is the banner-tail, one of the large kangaroo rats.

These are only a few of the many species of rats and mice. Most of them do not merit the animosity generally felt toward them merely because they are called rats or mice. In abnormal numbers many of them may become a problem, but as individuals they are among the most fascinating of our mammal groups.





"Porky", above, belongs to a separate family from other North American rodents. His distinguishing feature, of course, is his overcoat of quills, which many people still think he has the power to shoot at enemies. This is not possible, although the quills are loosely set and easily become loose and stick to other objects.

The woodchuck in the tree, above, is photographed in a rather unusual place for a woodchuck. Nevertheless, he got there himself, and was photographed by Lee Ottaway.



In the middle left is the apple mouse, better known as the pine mouse, a famous burrower that feeds on roots and often is a source of danger to apple and other fruit trees. In the middle right is a grasshopper mouse. There are some fifteen species of this last group, nocturnal in habit and making the major portion of their meals from soft-bodied insects.

At the left and right we find two allies of man in keeping the population of small rodents in check. Our owls and hawks, although persecuted by hunters seeking targets for their guns, are of much value to the farmer, who often ignorantly shoots them himself. Nature set up a system of checks and balances in wildlife, but man has upset the system.





Kruger Park

In South Africa is Kruger National Park, set aside to protect the wildlife of that region. It is called the largest natural zoo in the world, and covers an area about the size of Belgium. More and more people interested in wildlife are visiting the area to observe and photograph its wild inhabitants. There is no shooting.

Safely hidden in the bush, the visitor may witness such scenes as that above, when the zebra and wildebeest come down to drink peacefully together at a water hole. It affords a thrilling and picturesque experience.

Or, if the visitor is motoring through the Park, he may see a lioness, such as the lady at the left, undisturbed and curious about the passing car. Lions in Kruger Park seem to have no fear of automobiles, or any particular interest in them. The noisy, shiny and odd-smelling affairs have no appetite appeal to the lion, so why bother. In fact, the warden reports that he has seen lion cubs, playing together, suddenly desert their play when an automobile passes and chase after it like dogs.





Above is the white, or square-lipped, rhinoceros of South Africa. This mammal is very rare; in fact, it is said to be one of the rarest mammals in the world. A few of these enormous creatures are still to be found in Zululand and Mashonaland, and there are stringent laws against shooting them. Below is a lion citizen of Kruger National Park, posing nicely for the camera. The protection accorded the wild species in the Park is gradually bringing to them a sense of security, even when man is about.





Above is the Kuder cow, or Kudu, one of the most magnificent members of the antelope family and a native of South Africa. Below a group of giraffes photographed in the bush in Kruger National Park.



The warthogs, below, are members of the pig tribe, and no beauties. In fact, the males, which are equipped with tusks, yield to no other mammal for downright ugliness of features.





F r i e n d s



Friendship with birds and mammals, whether they are wild or tame, is a cherished experience. Here we see some friends. Above, Asahel Curtis has photographed a classic friendship between fawn and cat. Cornelia Clarke discovered a dog's affection for chicks, and Harold H. Nicholson found the friendship, with reservations, between the youngster and the pelican. The young man and the pups at the left, as snapped by J. G. Allen, seem altogether happy. Baby, below, shares lunch with her guardian—or his. An Eastman Kodak prize picture by Mrs. C. R. Waterbury.





SEEDS THAT TRAVEL

As the blooming season draws to a close, an interesting subject for a walk in the woods and fields is to be found in observing seeds and how Nature has contrived that these seeds may be dispersed, find a home in welcome soil, and carry on the race. We know, of course, that birds take care of a lot of this work, but Nature has willed that other means be provided also. One of these is the wind, for whose cooperation Nature has provided wings or soft down so that the seeds may ride the autumn gusts. Of the seeds thus carried, those of the dandelion are the most familiar, although those of the Virginia goatbeard at the right, above, travel in a like manner, as do the seeds of the wild clematis at the right.

Photographs by L. W. Brownell.







On these two pages we see more seeds for which Nature has made wise provision. We are all familiar with the silken down attached to the common milkweed, at the upper left of the opposite page, and most of us know the coltsfoot next to it. At the bottom of the page is the fruit of the cattail of the marshy spots, which spreads also as the capricious breezes blow away its down.

Those of us who tramp the fields and woods in the late summer and early fall often serve in the same way that animals have long served in spreading seeds. A rabbit, a fox, or a sheep will catch in its fur the seeds of the common burdock, above, or those of the cocklebur, beside it, and drop them or rub them off later on. So, also, do we gather them in our hikes, picking them off as we go and tossing them into the nearby thicket. Or we may gather a large load of the showy tick-trefoil at the right, which clings like adhesive plaster on a tender spot when we try to rid ourselves of it.

Examine these seed coverings under a glass and discover the clever and efficient provisions Nature has made for them to catch and cling to whatever may brush against them. Here we have a simple but fundamental lesson in the wisdom of Nature's plan.





The dingo is a native wild dog of Australia, still numerous in some sections despite continuous warfare from sheep raisers. They frequently hunt in packs, and are famous for their cunning and a notably dismal howl. They resemble somewhat a yellow collie, although they have shorter hair. Below are two wombats, Australian marsupials provided with powerful muscles and strong claws for burrowing. They are nocturnal, eating roots, trees, shrubs and grasses. They look somewhat pig-like, and their flesh tastes surprisingly like pork. Photographs from the Australian National Travel Service.





Above are two startling examples of Nature's handicraft in the Andean Mountains of Peru. Here, at an elevation of 14,000 feet, is to be found a rock "forest" dating back to Antediluvian days. Marine shells are scattered on the ground, and at one edge of the area is a mountain of pure rock salt. Once this area was the basin of an inland sea.

At the right is Glacier Rock in Yellowstone National Park, curious because it is the only large rock of its kind for miles around. It arouses interesting speculation as to how it strayed away alone.





Again we see strange instances of Nature's work. At the left is a peculiar rock formation in the Absaroka Mountains of Montana. This strange figure is composed of countless pebbles and boulders all stuck together.

Below is a grinder rock taken from a hole in solid rock thirty-two feet deep. The round rock weighs several hundred pounds. It was found at Taylors Falls, Minnesota. The pot-hole that was formed by the grinding of this huge stone is about eight feet across, indicating that the power of the water in turning the grinder must have been terrific. How long this had been going on is a matter of pure speculation, but the stone was rounded almost perfectly in the process. Photographs by

B. L. Brown.



★ Conservation ★

A section of Nature Magazine devoted each month to the expression of practical opinions on the vital issues affecting our use and abuse of natural resources, including wildlife, and dedicated to the purpose of assisting Americans to play a militant part in the attainment of constructive conservation aims.

ARTHUR NEWTON PACK, *Editor*

WHAT OF THE CLOSED ★ SEASON?

decided. By that we mean that no intimation has come from those in whose hands the fate of the birds lies as to whether or not there is to be a closed season. It is quite possible that before this page comes from the presses of our printer, the issue will have been decided.

Not being clairvoyant we cannot now tell what will happen. Having only the interests of the birds at heart, we are not in the confidence of those who hold dominion over them, either as officials or under the guise of sportsmen. All we know is that the facts of the tremendous falling off in numbers of migratory waterfowl have been

As this is being written, and this issue of NATURE MAGAZINE goes to press, the fate of our migratory waterfowl has not yet been

proved and published; that they cannot continue to survive the assault of the hunters' guns in their present depleted state; that they will be virtually gone before adequate breeding grounds and extensive sanctuaries can be established to rehabilitate their numbers.

This we do know, and say without equivocation: If there is not a closed season on migratory waterfowl this year President Roosevelt, Secretary of Agriculture Wallace and Chief of the Biological Survey Darling will have betrayed a trust. They will have sacrificed a natural resource of great value and beauty on the altar of greed. They will have yielded to the dictates of a blind and selfish minority.

As we write this we pray that they will not have bartered this resource, but we have a sickening feeling that our prayer will not be answered.

LEAVING SEED ★

Years ago when hunting was not the universal fad it now attempts to be, it was done largely by gentlemen sportsmen, each of whom kept more or less to his own bailiwick. He knew game conditions there and he did not overshoot. Toll would be taken of a given covey of quail but once in a season perhaps, and when rabbit shooting ceased there were plenty of known survivors. In other words some were left for seed.

Now that all places are accessible to the mob (we can scarcely call it less) of gunners, the same ground may be hunted over and over again. Later parties do not know and probably take no thought of what may have been done by earlier ones. Remnants of coveys of quail may have collected, but when they are killed the seed stock itself is destroyed. Lack of familiarity with the area, if no other reason, prevents the exercise of judgment as to how many quail, rabbits, or other game should be taken, and the inroads of party after party cut down the stock until there is little or nothing left. This is in violation of the fundamental game management principle that the kill should be from a surplus for the particular area involved

and that the extent of it should be determined each year on the basis of full information.

We read statements based on studies made on special areas that hunters do not destroy an alarming proportion of certain game species, but this should not be permitted to obscure the fact that in the environs of towns and cities they have destroyed all or nearly all game. The same fate awaits every area to which numerous hunters have access unless the kill is regulated. Adequate seed stock must be left if the population is to continue.

Where the system of free public shooting prevails, can effective arrangements be made to preserve sufficient seed? Upon the satisfactory answer to that question, in deeds not in words, depends the continuance of the American hunting system. We see flattering references to the way the problem has been solved in other lands, but it has not been solved. There is no thickly populated country where free public shooting and an abundance of game go hand in hand. In old countries where game is plentiful, that condition prevails only on preserves and estates where all shooting is regulated, sometimes restricted to officials, the kill is strictly limited, and poaching is a jailable offense.

If American hunting is to be kept from arriving at the same end, it must be through the exercise of a degree of restraint and altruism yet to be demonstrated in the modern generation of gunners. They must leave seed and do

all other things needed to perpetuate game stocks or the latter soon will exist nowhere except on landed estates and other rigorously protected areas. Certainly intelligent Americans do not want to see any such condition exist.

DOLLAR-A-YEAR MEN IN SPORT

During the World War we became acquainted with dollar-a-year men, mostly an honorable fraternity who sacrificed large incomes to the country. A dollar a year was their compensation.

Now we are confronted by dollar-a-year men of quite a different stamp. Instead of serving the country, they are making demands upon it. And why, forsooth, are they so importunate? Because they will be required to pay a license fee of a dollar a year—a tiny tax which they are pleased to call a contribution.

Their demands began, moreover, not only long before any tax was collected but even before the law establishing the tax was passed. Witness these remarks by the editor of a leading sporting magazine. "If the sportsmen can pass this measure through Congress, we will have spiked the guns of the crowd that wants to stop all shooting. Then the duck shooters of this country can demand their rights on the basis that they are going to put up the money to buy nesting, resting, and feeding grounds to assure waterfowl the protection they must have if we are to continue to enjoy the sport of hunting them."

Further on he says "let's pay our way as we go" and he advises hunters to write to Congress and "Say you are a duck hunter and you want to pay for your sport—you want to take out a dollar license."

"Pay our way as we go," "Pay for your sport," with a dollar a year! What effrontery! What ignorance! The value of each bird a hunter of migratory game birds may

UNENFORCEABLE GAME LAWS

"This is no time to squabble about petty, unpopular, and unenforceable shooting restrictions." So we are informed in a recent publication on game birds, and so we are harangued at almost every sportsmen's meeting. Along with such admonitions come repeated assertions that restrictions on hunting privileges cannot be enforced—until the situation as confessed by sportsmen themselves seems to be that every hunter needs a warden at his elbow to compel him to obey game laws and regulations.

If this is really the state to which sportsmanship has been reduced, and on many occasions we have had the word of sportsmen for it, then the perpetuation of game stocks in this country is impossible. If restrictions on hunting must literally be enforced, the cause is lost, for there is no possibility of maintaining a warden force that can actually supervise the activities of the American army of hunters, variously estimated to number from 8,000,000 to a

kill is more than a dollar. If he were actually on a pay-as-you-go basis, he would not be entitled to a single bird. This is speaking in terms of reproduction values, and most of the wild fowl cannot be reproduced except by Nature's methods. So common a bird as the lesser scaup or little bluebill, for instance, has never been bred in captivity. Numerous species have been so bred only rarely and we may be sure it has been at a cost of far more than a dollar per bird.

Costs of artificial propagation are cited only as a convenient measure of the value of individual wild fowl. In reality, nearly all of the birds brought to bag by American hunters are produced in the wild. Not only that, but 85 per cent of them are bred in Canada where the dollar-a-year tax cannot reach to aid the wild fowl. If American breeding grounds are improved so as to give maximum production, they will still yield far less than half of the wild fowl hunted in this country.

Free public shooters, the American ideal, have always been spongers; the puny license fees about which they prate have never covered more than a fraction of the cost of production of the game they have killed. Where upland game has been taken they have sponged mainly upon farmers, and in the case of wild fowl they have bagged for the most part birds produced by Canada. Yet they have the supreme impudence to talk of paying their way. They have never done so and they certainly will not do so under the nominal dollar-a-year duck stamp tax. Unless they are content to be one-trash-duck-a-year men, or one-good-duck-every-few-years men, they are not entitled to make much noise about being dollar-a-year men.

figure twice as great. What a warden army this would mean!

Voluntary cooperation in obeying regulations intended for the benefit of all is necessary to the preservation of our game birds and animals and it should be forthcoming in generous measure. If sportsmanship has not wholly lost its meaning, we should expect proffers on every hand to obey and uphold the law in letter and in spirit. Instead we hear "How are you going to enforce it?", "It cannot be enforced."

Such comments would be expected, perhaps, from an assemblage of criminals, but coming from reputed sportsmen they evoke amazement and despair. If these are the hands to which conservation must be entrusted (and daily they reach more greedily for control), the cause is utterly and irrevocably lost. If genuine conservationists, those who are so for the good of the cause, and without selfish motives, cannot win back some of the ground lost, and prevent further encroachment by those whose "axe to grind" is the largest part of their equipment, the conservation of American wildlife is doomed, inevitably and completely.



GUNSIGHT LAKE IN GLACIER NATIONAL PARK

PHOTOGRAPH COURTESY THE GREAT NORTHERN R. R.

This glorious area is so eminently worthy of preservation as a National Park that it is a deprecation of its value to extend National Park status to many inferior areas

CONSERVATION AND USE

LATELY the idea is being promulgated in certain quarters that the way to save something is not to use it.

This philosophy of desuetude is as old as error itself, and we cannot avoid being reminded of a well known parable from the New Testament, wherein several individuals, when given a varying number of talents, handled their responsibility in different ways. One put his talents to work, and at the end of the allotted period had more than he started with; another put his into a hole in the ground, which he jealously guarded.

Like those very talents, the publicly owned lands of the United States may be treated in either of these ways. Land may be used to produce crops, trees, forage, grass, or it may be used purely and simply as a playground. Much of our public land is capable of being used in several different ways at the same time. Our National Forests of the West offer an example. They furnish a marvelous recreation area, and indeed some specific areas doubtless need to be dedicated to this exclusive purpose. At the same time, the great bulk of the National Forests, and other public lands as well, can, if properly regulated, continuously support wild game and domestic stock in proper proportion, and at the same time produce trees which, if selectively harvested, will again reproduce without in any way destroying the other land values to be enjoyed there. Thus we have in the United States Forest Service a prin-

ciple which has been given the high-sounding name, "multiple-use conservation."

It is certainly not our purpose to maintain that this multiple-use conservation is always perfectly administered, or that it is never bungled. The human element is difficult to deal with, but the progress made in the management of our National Forests over the last thirty years has, on the whole, been remarkably deserving of praise. What the Forest Service has done under the Department of Agriculture is at least an attempt to apply the principles of Nature's own reproduction, aided rather than hindered by the operations of mankind.

On the other hand, we have in the Department of the Interior another efficient government bureau which we all know as the National Park Service. The National Park Service grew up in an attempt to prevent the rapacious destructiveness of man, and on the theory that the only sure means of controlling this was to set aside certain peculiarly interesting and attractive areas to be forever free from any and every kind of use, other than recreation. There have been raids upon the boundaries and the entities of our National Parks, but on the whole, the public has supported them wonderfully well—so well indeed that the National Park Service has behind it a large measure of popular support, effective in Congress and militantly eager to extend the application of the National Park theory further and further. Yet with all due respect for the

absolute suitability of the National Park theory to the conditions which nurtured it, none the less it behooves real conservationists to stop, look, and listen. *The National Park theory is not multiple use but single use.*

In addition to the National Parks proper there are National Monuments scattered throughout the United States—smaller areas not capable of attaining what might be called National Park status, but none the less worth protecting. These are also administered by the National Park Service on the single-use theory. With the recent flood of public moneys applicable to all sorts of purposes, friends of the National Park Service have been urging various new parks and monuments and extensions of old ones. In the Southwest an attempt is now being made to link up scattered National Monuments by the acquisition of areas in between them by the National Park Service. A bill has also been proposed in Congress which would turn over to the jurisdiction of the National Park Service a strip four hundred feet wide on either side of every public highway, wherever it traverses public lands.

The motive behind such a plan is undoubtedly honest and sincere, but its ultimate effect seems worthy of question as against the fundamental principles of true conservation. What such a movement means, actually, is the taking away from the National Forests of very considerable areas now under administration according to principles of multiple-use conservation and locking them up solely and exclusively for recreational use.

It has been the consistent policy of the National Park Service to "develop" the majority of areas assigned to it for recreational purposes and to install many so-called comforts and conveniences of modern civilization. These "developments" include unnecessarily good and expensive roads and other conveniences to bid for otherwise un-

willing tourist travel. Such developments, we believe personally, are not always conducive to the best recreational uses of the American people. They do not lead to a true appreciation of Nature, but rather to a regimentation of so-called recreation until the real pioneer instinct, which is the strength of our nation, is weakened to a false standard of artificiality.

Protection of our existing National Parks and of occasional really necessary additions is right. They should be kept forever free from commercial exploitation, but further wide extension of the single-use principle of conservation is dangerous, and this danger is increased whenever the same policy tends to "civilize" the little true wilderness that remains for recreational purposes. In short, just because our National Parks have been a success is no justification for over-playing a good hand. Let us keep a sense of practical values.

Today we are confronting two divergent paths of conservation, whose differences we endeavored to point out in our previous article dealing with a proposed Federal Department of Conservation and Works. Once again we must realize that land use, generally speaking, requires a distinction between reproduceable assets, such as growing things—plants and animals—and non-reproduceable resources, such as oil, coal, and minerals. Let us by all means have management and conservation, but why lock the door and throw away the key? Over-extension of the National Park principle is a gesture of precisely that type. The "glorious record" claimed by the Department of Interior is based largely upon the fallacy of "conservation" by limited use, rather than upon the fundamental laws of Nature, which Agriculture is bound to observe.

For fear of losing our "talents," let us not make the mistake of burying them forever.

A MOTHER GOOSE THEORY

It is not those with an ever-present sense of the reality of evolution who say of the so-called lower animals, "they were put here for our use." From the evolutionary point of view every creature has developed in the same way in its sphere as man has in his, and each has the same right to existence.

The view that "they were put here for our use" not only is not in accord with evolutionary teaching but is extremely naïve; a moment's reflection shows its illogicality.

If the so-called lower organisms could say what they think of this theory, human adherents to it would soon be disillusioned. But as actions speak louder than words, we need have no doubt of what some forms would say about the matter if they could.

Do cockroaches, mosquitoes, bedbugs, chiggers, lice, and tapeworms, for instance, act as though they were put here for our use? On the contrary, their actions fully accord with the assumption that we were put here for

their use. At least, they spend their lives shortening ours.

Assumptions on either side are out of place, however, for it is evident that whether man, beast, or crawling thing, we are all here on the same basis. We are all survivors of lengthy and complicated evolutionary histories that in themselves entitle each to respect.

The respect whether admitted or not must, however, be mutual. Certain of our brethren force that view upon us as, for instance, the parasites mentioned, and organisms causing disease; we must regard these seriously and take steps to protect ourselves from them. We do not, however, conquer or exterminate them because we cannot. To do so where we can—that is, in the case of inoffensive creatures—is merely to bully. There is nothing creditable to man in the persecution of wild things just because he can.

The plea that "they were put here for our use" as an excuse for harsh domination and cruel exploitation is a childish one, no more to be seriously entertained as a reason for deliberate action by grown men, and the shaping of public policy, than would be a bit of doggerel from Mother Goose.

HAWKS—WHAT THEY EAT

By LEO A. LUTTRINGER, JR.

A LARGE broad-winged hawk with short, red-brown tail soared lazily above a grassy field near a farmer's barn. Suddenly it dropped, and the farmer, observing the maneuver from a window of his house, said to himself, "There goes another one of my Rhode Island Red peeps. That's a couple of dozen that critter got in the past few days. I'll get him if it takes me all summer." But that big old red-tail hadn't touched one of his chicks—not to say he might not under some conditions, however. Every time he stooped he gathered unto himself not one of the farmer's poults but a nice juicy field mouse. He had caught hundreds of these rodent pests while the real culprit—a sly old weasel from a nearby rock pile—continued his daily slaughter unhampered and unseen.

How misunderstood and misnamed our big friend the red-tail! "Chicken Hawk" they call him locally and as such farmers seek his scalp whenever they can. And so it is with his kin the red-shoulder and broad-wing hawks. They go about doing one good turn after another day after day—Boy Scouts of the air—for which they deserve much credit and get little.

Now I consider myself by no means one who fails to see the bad in any creature, nor do I fail to see the good in them. I am not inclined to brand a whole species as killers simply because there happens to be a few Dillingers



RED-TAILED HAWK

PHOTOGRAPH BY JACK D. PULLEN

Often unjustly accused of predatory activities, it is ruthlessly killed by "vermin hunters"

among their numbers, nor will I refrain from advocating a strict program of control of any group, good or bad, if their numbers in any locality are great enough to threaten the welfare of other more desirable or more valuable forms of wildlife. Where to draw the line is a problem to be worked out only after the most serious study is given the subject in the area in which it occurs.

And now, having established myself in this more or less neutral position, I present for the perusal of all those interested in our birds of prey a record of the stomach contents of 2232 hawks of various species that it has been my privilege to examine during the past eleven years. Fully fifty percent of all of them were examined personally, and no stone was left unturned in an effort to gather all data possible surrounding each case, or to prove conclusively by checking series after series of bones, feathers and fur, insects, etc., just what kind of creatures constituted each individual bill of fare.

All in all from November, 1924, to February 6, 1934, a total of 2232 hawks were forwarded to the offices of the Pennsylvania Board of Game Commissioners, the vast majority being received shortly after a bounty of \$5 was placed on the goshawk in 1929, and which is still effective during the period between November 1 and May 1. Some of these were not examined, for the simple reason that many were too decomposed for even a keen enthusiast to tackle.

A number of the hawks whose stomachs were empty had been caught in traps and a record was kept of this information during the first two years of the Goshawk Bounty with the following results: eighteen Cooper's hawks were trapped; sixteen goshawks; seven red-



PHOTOGRAPH N. Y. ZOOLOGICAL SOCIETY

THE DUCK HAWK

Also the object of persecution and shooting by hunters who do not know one hawk from another

tailed hawks and twelve red-shouldered hawks.

It is extremely unfortunate that the stress of other duties prevented the examination of any hawks during the period between February 6, 1934 and May, 1935, as these data would have added greatly to our records. It is hoped that, however, the study will be continued next fall if time permits. During the above period there were received 24 marsh hawks, 7 sharp-shinned hawks, 135 Cooper's hawks, 175 goshawks, 93 red-tailed hawks, 34 red-shouldered hawks, 8 broad-winged hawks, 6 rough-legged hawks, 5 duck hawks, 3 ospreys, and 5 sparrow hawks.

It is also regrettable that no stomach examinations are made of the hawks turned over to local Game Protectors for identification, but these men are far too busy with their law enforcement and other duties to keep such records.

Readers may wonder why percentage charts are not used to show exactly how destructive or beneficial each species were. There is a good reason why this was not done. In the first place it would be most unfair to credit such species as the red-tail and red-shoulder with as much game as the records show they consumed when our study proved beyond any doubt that much of it was

crippled. Many a squirrel, rabbit, or quail taken from these species held shot grains, and it is only logical to assume that had they not been injured they would hardly have fallen prey to such slow-flying hawks. If space permitted the complete recording of all those birds examined during the summer, or shall we say those examined prior to the hunting season, during the hunting season, and after the hunting season, proof beyond a doubt could be offered that in only a very few cases did the Buteos take game. And as has been mentioned before, one should not blame any species as a whole for the depredations of a few. If this were true then Pennsylvania, perhaps the greatest bear state in the Union, would brand all these splendid creatures outlaws simply because a few develop the individual habit of destroying livestock and beehives.

On the other hand it must be admitted that strict programs of control are necessary when such species as the Accipiters become so numerous in a community that the ranks of the game and song birds are seriously depleted. A mistake often made nowadays is that most persons fail

to recognize the living conditions of our birds of prey with advancing civilization. Man has naturally upset the balance of Nature, and, as a very good friend of mine once said, "A hawk in densely populated Pennsylvania today may well have quite different feeding habits than the same species fifty years ago on plains and prairies, with their scanty population of men and poultry, and their abundance of field mice and other rodents."

In many localities advancing settlement has crowded out or driven to cover the predator's natural food, and in such instances the predator cannot be blamed for taking what he can get instead, even if it is something Man wants for himself.

Let us give our hawks and owls a square deal, and if at any time we are forced to investigate their status in a community, let us bear in mind that the problem is *purely local*, and not apply the age-old rules of habit which are usually applied to the various species universally.



PHOTOGRAPH BY WILLIAM L. FINLEY

A SPARROW HAWK

This attractive little hawk includes many insects in its diet and does not merit persecution

MARSH HAWK. There were 95 marsh hawks sent in for examination. The stomachs of 38 were empty; 3 were unfit; 3 held rabbits; 4, red squirrels; 4, quail; 8, song birds; 1, feathers (unidentified); 28, mice; 1, unidentified fur and hair;

1, chicken. Of the above, 1 held parts of a rabbit and the bones, fur and feet of several field mice; 1 held parts of a quail and a rabbit; 1 held remains of several small birds and the fur and bones of a chipmunk; and 1 contained the remains of a gray squirrel, and a partly digested Blowing Viper.

SHARP-SHINNED HAWK. Two hundred and one sharp-shinned hawks were received, the stomachs of 87 of which were empty, and 4 unfit. Of the others, 1 held rabbit; 98, song birds; 6, feathers (unidentified); 1, mice; 1, chicken and 1, nematodes (parasitical worms).

COOPER'S HAWKS. Four hundred and twelve Cooper's hawks were submitted; of these, 218 stomachs were empty and 20 were unfit for examinations. Eight held rabbits; 12, gray squirrels; 9, red squirrels; 1, a flying squirrel; 1, an opossum; 1, a skunk; 2, ring-necked pheasants; 1, quail; 38, song birds; 11, feathers (unidentified); 1, a wood rat; 19, mice; 1, fur and hair (unidentified); 33,

chickens; 3, pigeons; 1, snakes; 1, beetles; 4, plant material and seeds; 11, unidentified flesh. Of these stomachs 1 held the remains of a chicken and a gray squirrel; 1 held parts of a chicken and rabbit; 2 held remains of several pigeons and other small birds; 1 held remains of a gray squirrel and rabbit; 1 held parts of a gray squirrel and field mouse; 1 held the fur of a rabbit, several mice, 2 grasshoppers and 1 white grub.

GOSHAWKS. There were 777 goshawks sent in for examination, the stomachs of 230 being empty and 9 unfit. Ninety-five held rabbits; 33, gray squirrels; 5, red squirrels; 1, black squirrel; 14, ring-necked pheasants; 153, ruffed grouse; 20, quail; 1, parts of a duck (unidentified); 17, song birds; 25, feathers; 3, chipmunks; 8, mice; 15, fur and hair (unidentified); 51, chickens; 2, pigeons; 1, a small snake; 5, plant material and seeds; 14, unidentified flesh. Of these, 2 held remains of a gray squirrel and a ruffed grouse; 1 held two grouse feet and a wad of hair; 1 held a small rodent (unidentified) and a grouse feather; 2 held remains of a ring-necked pheasant and ruffed grouse; 2 held remains of a rabbit and chicken; 1, the remains of a rabbit and 3 freshly eaten white-footed mice; 1 held the feathers of a robin and a red squirrel; 1 held the remains of a small snake (unidentified) and some feathers, likewise unidentified; 1 held remains of a woodpecker and white-footed mouse; 3 held the remains of a rabbit and feathers from some small passerine bird; 2, rabbit and gray squirrel; 1, some field mice and small birds; 1, remains of a rabbit, and a song sparrow; 2 held remains of rabbit, squirrel, grouse and some small birds; 1 held remains of quail, rabbit and squirrel; 5, the remains of rabbit and ring-necked pheasant; 1, the remains of 3 rabbits and 1 grouse; 1, parts of a rabbit and pigeon; 1, parts of a quail and rabbit; 1 held feathers either of a grouse or ringneck; 5, quail and grouse; 1, rabbit, ringneck, also a few quail feathers; 1 held the remains of a quail, gray squirrel and feathers of a Blue Jay; 2, feathers of quail and several song birds; 4, remains of chipmunk and grouse; 13, parts of squirrel, chipmunk, grouse, rabbit, white leghorn and red squirrel; 1, remains of a chicken and some feathers of small birds; 1 held parts of 2 grouse and 2 rabbits; 4 held remains of grouse and rabbit; 1, small birds and gray squirrels; 1, rabbit fur and field mouse; 5, quail and rabbit; 1, squirrel and quail.

RED-TAILED HAWK. Four hundred and sixty red-tailed hawks were submitted. One hundred and sixty-one were empty and 106 unfit. Thirteen held rabbit; 12, gray squirrel; 20, red squirrel; 2, raccoon; 1, a skunk; 4, ringnecks; 2, grouse; 1, quail; 1, song birds; 4, feathers (unidentified); 2, chipmunks; 1, brown rat; 49, mice; 3, shrews; 1, mole; 13, fur and hair (unidentified); 13, chickens; 3, snakes; 3, grasshoppers; 2, beetles; 2, nematodes; 1, insects; 3, plant material and seeds. Of these 1 held a red squirrel and a mouse; 1 held two water snakes and 6 grasshoppers; 1 held a small unidentified bird and a mouse; 1 held a red squirrel and a spring

peeper; 1 held rabbit and field mice; 1 held parts of a grouse and 4 mice; 1 held a bob-white and the head and ears of a young rabbit; 1 held several mice and small frogs; 1 held remains of small passerine birds and several field mice; 1 held the greater part of a white leghorn chicken and 1 whole field mouse; 1 held 35 grasshoppers and parts of a red squirrel; 1 held 6 grasshoppers and 1 whole mouse; 1 contained the remains of a Plymouth Rock, a field mouse and a grasshopper; 1 held 3 whole field mice and 2 garter snakes; 1 held a Plymouth Rock and 1 garter snake; 1 held 2 garter snakes and parts of a red squirrel; 1 held two mice and 1 garter snake; 1 held a field mouse and a nematode; 1 held a grasshopper, crawfish, caterpillar, spider, shrew and field mouse; 2 held grasshoppers, a deer mouse and parts of a small passerine bird; 1 held earthworms, several nematodes and parts of a rabbit; 1 held 3 nematodes, a piece of grass and some feathers; 1 held the remains of a small snake and a compact ball of field mouse fur; 2 held remains of field mice, frogs and some feathers which resembled those of a chicken; 1 held remains of a large snake, probably a water snake, feathers from some small passerine birds, and fur and bones from field mice; 1 held 2 crickets and 2 katydids; 1 held the entire body of a shrew and much flesh and feathers of a ruffed grouse; 1, the remains of a field mouse and snake, the latter unidentified; 1 held the remains of a Hermit Thrush and a chipmunk; 1, the remains of a field mouse and a chipmunk; 1 held remains of 2 red-backed mice and a small passerine bird; 1 held several crickets and a longhorned beetle; 1 held a garter snake and field mouse; and 1 held several grasshoppers and a half grown leghorn chicken.

RED-SHOULDERED HAWK. There were 221 red-shouldered hawks sent in for examination, the stomachs of 82 of which were empty and 44 of which were unfit. Five held rabbit; 3, gray squirrels; 3, red squirrels; 1, a muskrat; 1, a ring-necked pheasant; 9, song birds; 1, unidentified feathers; 31, mice; 1, shrew; 2, unidentified fur and hair; 6, chickens; 5, snakes; 1, fish; 1, a frog; 1, a salamander; 4, grasshoppers; 2, insects and bugs; 2, plant material and seeds; 1, unidentified flesh. Of these 1 held 5 small snakes (garter) and a field mouse; 1 held 18 grasshoppers and parts of a crawfish; 1 held a grasshopper and white-footed mouse; 1, the remains of several mice, a small garter snake, and some scanty insect remains; 2 held grouse and a garter snake; 1 held a grasshopper, several crickets and a field mouse; 1 held a caterpillar and some unidentified feathers; 1 held insect larvae and some fur; 1 held a caterpillar and a mouse; 1 held 37 grasshoppers and 5 crickets; 1 held an eight-inch garter snake, 40 odd grasshoppers and a cricket; 1 held crawfish and remains of a Plymouth Rock chicken; 1 held a crawfish and a mouse; 1 held remains of a rabbit and a whole mouse.

BROAD-WINGED HAWK. Of twenty-two broad-winged hawks received, 5 were empty, (Continued on page 177)

Isle Royale National Park

Threat of Lumbering Speeds Move to Preserve Island

MINONG, the Indians called it, and in their tongue it meant "the good place to get copper". Standing before a map, Benjamin Franklin, envoy of the fledgling nation at the treaty discussions closing the Revolutionary War, drew a line that included it in the territory that became the property of the United States. Today it is known as Isle Royale.

Lying forty-five miles north of Keweenaw Point in Lake Superior, this island, forty-four miles long and varying from three to nine miles in width, should become our newest National Park. Authorized by Congress in 1931, its addition to the list of Parks waits only on the acquisition of the territory by the State of Michigan and its transfer to the Federal Government. As this is being written the threat of lumbering on privately-owned tracts on the Island is speeding the movement to preserve the area. This has taken form in the formation of the Isle Royale Park Association, bringing together the interests of Michigan, Wisconsin and Minnesota in the final establishment of Isle Royale National Park.

Isle Royale is a worthy addition to the National Park roster. Two hundred and five square miles in area, embracing twenty-five lakes, heavily forested with much virgin timber, diversely populated with birds and mammals, the island is the largest United States-owned land area in the Great Lakes. Geologically it is interesting as an example of the upturned edges of an ancient lava flow and for its association with the glacial age. Historically it is intertwined with the life of the Indians before the first white man set foot on this continent.

One of the fundamental reasons for the creation of a National Park is to save for posterity an outstandingly typical area of our varied country. Civilization and development have claimed so much that we cannot delay action where the region justifies. Surveys entitle Isle Royale to such distinction. Twenty-one species of trees, thirteen of which are deciduous, are found on the island. There has been little cutting and fire has providentially done little damage. Bird life is prolific, partaking of the mainland on both sides of the lake and including many sub-arctic species. The moose herd on the island, variously estimated at from two thousand to five thousand head, is its outstanding mammal feature, although it also supports a varied small mammal fauna. Wild flowers abound, and one expedition brought back specimens of thirty species of orchids.

Added to its outstanding natural history value, Isle Royale would join with Mesa Verde as a Park with Indian significance. More than one thousand pits worked for



COW MOOSE AT ISLE ROYALE

This lake island supports a large herd of moose, and the herd will be protected in a park area

copper by early Indians, other relics of their remarkable mining operations, artifacts that seem to indicate the prehistoric presence of several different tribes, and one discovered ossuary of distinct ethnological interest all hold promise of further discoveries.

At present Isle Royale is uninhabited during the winter months but during the summer several fishing camps



TWO VIEWS OF THE SHORE LINE IN THE ISLE ROYALE NATIONAL PARK AREA

The island itself is forty-four miles long and from three to nine miles in width. Its shore lines have many lovely bays and it supports an extensive growth of virgin timber in a splendid wilderness, most of which, it is hoped, will be preserved as a wilderness area after the island becomes the newest addition to our system of National Parks

and tourist resorts are maintained at Rock Harbor and Washington Harbor. These are reached by weekly steamer service from Duluth, Port Arthur and Houghton.

Quite naturally there is a distinct commercial interest in the final creation of this National Park. Railroads, boat transportation groups and resort owners are understandably anxious that the project be brought to a successful conclusion. Some of the enthusiasts for the area appear to envision the island webbed with highways and trails. We trust that this enthusiasm will be effectually tempered. Road building into every conceivable now inaccessible area is a current curse.

A substantial portion of Isle Royale's virgin forest should be set aside permanently, and immediately upon its acceptance as a National Park, in its present wilderness state. Man has never yet improved upon Nature's wilderness by his invasion of it. On the contrary, he has ruined it. When he sets about to "clean up the forest" he spoils it. If Isle Royale is to become a National Park



it should be with the definite, agreed and proclaimed understanding that the major portion of it is to be preserved and left as it now is. If such a policy is established we hope that Isle Royale National Park becomes a fact as quickly as possible. If this is not to be the policy we have no interest in it whatsoever. Better leave it to the lumbermen than to make it a picnic shambles in Lake Superior. It is a region worthy of the wisest protection for the enjoyment of generations to come.

(Continued from page 175)

4 unfit. Two held mice; 1 held part of a small unidentified snake; 1 held beetles. Of these 1 held a mouse and parts of a cricket; 1 was literally gorged with beetles and grasshoppers; 1 held a number of large grasshoppers and some bones and fur which were not identified; 1 held a field mouse and a large bug; 1 held several grasshoppers, the remains of a hard-shelled beetle and a good deal of field mouse fur; 1 contained a partly digested mouse and some blue feathers, apparently those of a Blue Jay.

ROUGH-LEGGED HAWK. Ten rough-legged hawks were received, 6 being empty and 3 holding mice. One con-

tained the remains of a Plymouth Rock and a mouse. DUCK HAWK. Eleven duck hawks were submitted, 6 of which were empty and 1 unfit. One held song birds; 2, feathers (unidentified); 1, parts of a pigeon.

OSPREY. Only 3 ospreys were received. 1 was unfit; 1 was not examined, and the other contained the backbone of a small fish.

SPARROW HAWK. Eleven sparrow hawks were sent in, 5 being empty, and 1 unfit. Two held remains of song birds and 1 held a caterpillar. One held several beetles and grasshoppers; 1 held grasshoppers and katydids.

PIGEON HAWK. Only one pigeon hawk was sent in and it was empty. These birds are rare in Pennsylvania.



BRINGING DOOM TO THE WILDERNESS

PHOTOGRAPH FROM U. S. FOREST SERVICE

When the tractors of the roadbuilders penetrate the untouched forest it means the end of a national asset that nothing man may do can restore

A NEW DEFENDER OF THE WILDERNESS

FOR some years the American Nature Association has taken a stand squarely behind the movement to preserve throughout the United States certain "wilderness" or "primitive" areas—tracts of land, whether they be forest, desert, lake, or mountain-top, that may be preserved in their original condition, unmarred and unmodified by the "improvements" of man. To this end we have long urged the creation of an organization whose purpose it would be to bring about the permanent retention of a few such areas in their present condition before the inroads of civilization wipe them out of existence. So it comes as encouraging tidings that a Wilderness Society has been recently formed in Washington, D. C., and that among its organizing committee are such well known proponents of the wilderness ideal as Aldo Leopold and Robert Marshall.

This Society is born none too soon. With the passing of each year the possibilities for setting aside wilderness areas diminish, and time is the vital essence of the problem. Back in 1926, Aldo Leopold, at the National Con-

ference on Outdoor Recreation, voiced this warning: "The real danger of failure lies not in opposition but in delay. One has no idea how rapidly the larger wild spaces are shrinking, and it will do no good to act after they are gone. It is a task of correlation and long-time planning." Nearly ten years have passed since that was said, and those ten years have witnessed the progressive shrinking of many of the few wilderness areas remaining; they have witnessed not only a lack of the correlation and long-time planning hoped for, but they have brought to the fore a new threat against the wilderness ideal far greater than all former menaces combined. And, curiously enough, this menace comes from an agency created in the name of conservation, and which has actually done an enormous amount of good in the conservation field—the Civilian Conservation Corps.

So far as conservation is concerned, the C.C.C. is a force that may be used wisely or unwisely. In itself it is nothing more than massed man-power put at the disposal of the administrators of tracts of land, and depending

upon the vision of these administrators for the effectiveness of its work. Now, it happens that so far as the wilderness areas are concerned, these land administrators are the Forest Service and the Park Service, since the great bulk of them now lie in Federal ownership. Both these Federal agencies have gone on public record as receptive to the wilderness idea, but it should be remembered that public pressure—the kind of pressure that counts—cannot be successfully exerted by uncoordinated efforts of the relatively few enthusiasts for wildernesses as against the great numbers who are personally interested in seeing area after area “opened up.”

These are the articulate ones. These are the ones who write their Congressmen, who besiege supervisors and camp on political doorsteps. John Jones wants a concession for a new resort. Bill Smith would like to graze more cattle, and the Podunk Chamber of Commerce dreams of vast opportunities if their valley is opened up with an automobile road. It means dollars and cents to all of them, and the fact that they are invading the last of the few remaining primitive areas weighs with them not at all. “Open them up, give us roads,” and once again the Park and Forest Services are inundated with telegrams, resolutions, and perspiring Congressmen.

It is this pressure, for roads especially, that has become overwhelming, and the combination of this pressure with the vast available man-power of the C.C.C. has resulted in a wild orgy of road-building such as the country has never seen. If not intelligently curtailed, it bids fair to solve the wilderness problem in much the same way the Turks set about solving the Armenian problem—by annihilation.

But what have we to hope for from the administrators of the Federal lands? Can we not look to them for preservation of wilderness tracts? Secretary of the Interior Ickes, who has the ultimate say over all the wilderness areas within the National Parks, is as indefinite as anyone could wish. “I think we ought to keep as much wilderness area in this country of ours as we can,” he tells us. “I am not in favor of doing anything along the line of so-called improvements that we do not have to do.”

What a definite, clear-cut policy this amounts to! Nothing certainly that could make a wilderness enthusiast reasonably sanguine for even the least plan-wise attack on the problem.

And what of the Forest Service? Here is one Forest Service conception of what a wilderness area should consist in: “No hotels, resorts, summer homes or other commercial enterprises will be allowed *unless a showing of public necessity is made*. Conservative grazing and

timber cutting will be permitted.”

There is equally little to hope for toward the preservation of wilderness from a statement like this. A showing of public necessity can always be made if the letters to Congress are numerous enough, and the wilderness area that is being grazed and logged bears as much resemblance to its primitive condition as a Hollywood Indian bears to Tecumseh.

So, gloomy as the prospect must be, one cannot look for aggressive leadership in preserving wilderness areas among Federal officials under whose jurisdiction these wilderness areas must ultimately come. It remains then for such an organization as the present Wilderness Society, through active, militant and untiring efforts, to assume that rôle before it is too late.

If leadership is to be taken, it must be taken by them, and it must be taken soon. Today there remain in the United States less than twenty wilderness areas of a million acres in extent, and each year these remnants are being invaded by roads and resorts. Robert Marshall has well said, “A few years more of hesitation, and the only trace of that wilderness which has exerted such tremendous influence in molding American character will lie in the musty pages of pioneer books and the mumbled memories of tottering antiquarians.”

The ways to ruin a wilderness are many—the ways to restore it have not yet been discovered, and with the vast impetus in road building made possible by C.C.C. labor, the possibilities of setting aside areas of sufficient size to constitute and provide wilderness conditions diminish every month. The Cascade crest in Washington has been literally riddled by roads of the C.C.C.; to the north and west of Mount Adams truck trails have opened up an unsurpassable wilderness country; the headwaters of the Selway are invaded by C.C.C. camps; and the Lolo Trail is only a memory. We have not only conquered the wilderness; we have destroyed it.

The last frontier is one with the bison and the passenger pigeon. The pioneer type yields to the radio crooner, and of the forest of yesterday only a pitiful remnant remains. But if we act now we may yet rescue from out our heritage a few small portions of this earth's surface and keep them inviolate. Sanctuaries of peace, where men may go to refresh themselves—literally to recreate themselves—and find that precious but ever more elusive thing, tranquillity. Success will come only as the result of aggressive and concerted action by an articulate organization equipped and eager to fight for the preservation of what little remains of our unspoiled wilderness.

We hope the Wilderness Society is such a group.

The American Society of Mammalogists at its recent meeting adopted resolutions urging that certain rare mammals, birds and other natural objects be designated as “National Wards” and thus accorded more than the usual protection; that King's Canyon in California, and Mount Olympus in Washington be made National Parks;

that a National Park or Monument be established in the Big Bend region of Texas; that wildlife conservation projects now conducted by various agencies be properly supervised by men equipped with adequate scientific knowledge; that sufficient land be acquired in the Jackson Valley of Wyoming to care for the elk herd.

FOR THE DUCK RECORD

WHILE it is more than probable that these words will be read after the 1935 season on migratory wildfowl has been decided and announced, we feel that it is proper that we should review for the record two important items bearing upon this issue. These are the imposing petition and expression of sentiment submitted by the Midwest Conservation Alliance, and the important pamphlet by Irving Brant, entitled *Collapse of Waterfowl Protection* and issued by the Emergency Conservation Committee. In the light of these anything other than a closed season will stand out as a heinous betrayal of a wildlife resource.

Mr. Brant sums up his objectives in two terse paragraphs, and with them we agree entirely. Conservationists and enlightened sportsmen, he says, make these demands:

1. Close the season on ducks and geese for at least one full year, with no reopening until breeding stock is restored to a level from which it can be built up despite a moderate season of shooting.
2. Abolish at once, and forever, the baiting of ducks and geese to kill them, and the use of live decoys, since these destructive and contemptible shooting methods will almost instantly wipe out whatever gains are made by closing the season.

Under the heading, "Wealthy Sportsmen and Commercial Clubs Hold Monopoly of Waterfowl," Mr. Brant points out that these agencies are destroying waterfowl faster than they can be produced, but that "despite the self-evident crisis, there are still hunters in America who demand both that the season be left open and that baiting be not interfered with. These men are not numerous, but they have influence disproportionate to their numbers." This is a very mild statement. He continues:

Powerful politicians, wealthy business men and individuals to whom shooting is the only relief from the ennui of idleness . . . are deluded by the great concentrations of waterfowl that result from baiting. Wishful thinking, perhaps, helps to blind these sportsmen to the truth, but hundreds have changed their attitude in the past year, and many more will do so as the truth is impressed upon them.

Beyond all this, however, there is a fighting core of powerful reaction, made up of sportsmen who want their shooting today no matter what happens tomorrow. These men are the real menace to American waterfowl. They are effectively organized, constituting the typical duck-hunters' association of states and metropolitan cities. In the past, along with the gun and ammunition companies, they have been the virtual dictators of government policy on any final show-down. If they dictate policy now, the waterfowl are gone.

So important is this pamphlet that we regret being unable to reproduce more than some of its most vital points. Failure to heed its admonitions spells waterfowl ruin, and the blame for this is definitely laid.

Mr. Brant quotes from Miscellaneous Publication No. 210 of the Department of Agriculture, 1934, as follows:

"The present reduced numbers of both ducks and geese are in sharp contrast to the incalculable numbers that 50, or even 25,

years ago reared their broods in the innumerable marshes and sloughs of the western states and in the well-watered regions of Alaska and Canada. Reduction in the numbers of North American waterfowl came on somewhat gradually over a period of years, as the human population increased, settlement advanced, more effective guns and ammunition were produced and used in larger and larger quantities, and means of rapid travel became common. Associated with, and a part of, these developments, vast drainage projects . . . seriously cut down the areas that produced waterfowl."

And:

"Serious drought conditions have arisen periodically throughout recorded history, always doubtless working hardship upon the waterfowl. But never, so far as is known, have there been so many destructive conditions and agencies at work at once upon a depleted waterfowl supply as during the past five years. During that period the numbers of waterfowl have fallen drastically. The support and interest of all public-spirited citizens are now needed to repair the damage."

For those who look on adequate waterfowl protection as a duty, it is inexplicable that the office entrusted with this duty after public announcement of these facts, should have encouraged and adopted the "staggered season" which "actually wrote into law the precise method of 'rest days' by which the heaviest slaughter of ducks is obtained on baited shooting grounds."

Under the heading, "The Blindness of Self-Interest", Mr. Brant says:

Not so the small, powerful clique of influential baiters whose sole thought is to give up no present privilege and let the future care for itself. They recognize that only three or four varieties of ducks are numerous enough to furnish sport shooting, but as long as there are any birds, of any variety, in fair numbers, they insist upon shooting them.

What will happen if this demand is yielded to? It will not mean permanent shooting of Mallard, Pintail and Black Duck. It will mean shooting for a few years, until these three species are down to the point of extermination, then a totally closed season, and an effort at restoration.

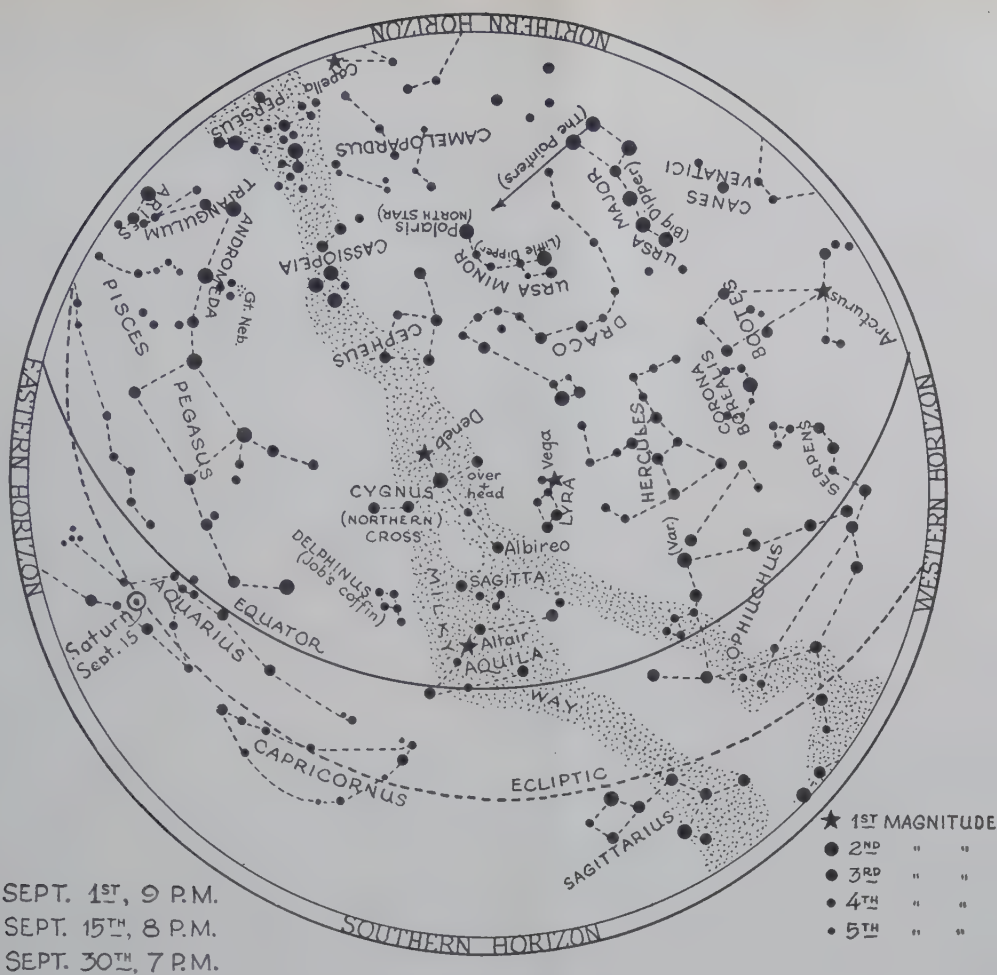
Restoration of what?

Not of the twenty-five species of waterfowl which can be brought back to safe numbers if adequate measures are taken now. *By the time the three most numerous species are down to the danger point, the others will have vanished forever.*

Mr. Brant concludes the pamphlet with the true and impressive statement:

Education, knowledge and a sense of humanity will modify the views of true sportsmen, but only the restraining hand of the whole people, exerted through their government, can cope with the exterminators. The forces of destruction have been dominant too long. They can rule no longer, without irretrievable disaster.

Imposing evidence of the awakened view of many sportsmen is found in the petition of the Midwest Conservation Alliance, signed by the officials of about one hundred sportsmen's clubs and many other groups and individuals. The petition asks a closed season and provision of adequate funds for its enforcement. The petition represents the views of 263,550 people. It should be heeded. Officialdom cannot afford to ignore it any more than the ducks can sustain another open season this year.



To use this map hold it before you in a vertical position and turn it until the direction of the compass that you wish to face is at the bottom. Then below the center of the map, which is the point overhead, will be seen the constellations visible in that part of the heavens. It will not be necessary to turn the map if the direction faced is south

Cygnus and the Northern Cross

By ISABEL M. LEWIS

THE Northern Cross in the constellation of Cygnus, The Swan, though less noted and generally regarded as less beautiful than Crux, The Southern Cross is, nevertheless, one of the finest configurations of the northern heavens. At this time of year it will be found overhead in the early evening lying directly in the zenith in mid-latitudes of the northern hemisphere at nine P.M. September 1.

The upright of the Cross, which lies along the path of the Milky Way, is outlined by four stars. The first magnitude super-giant star, Alpha Cygni, Deneb, or Arided, as it is variously known, is the brightest of all its stars and lies at the top of the Cross. This is intrinsically one of the most luminous stars in the heavens, equal in brightness to the combined light of ten thousand suns such as our own, but it is so distant that its light takes six and a half centuries to travel to the earth at the speed of 186,000 miles per second. Gamma Cygni, which lies next to Deneb on the south, is a second magnitude

star at the intersection of the cross-arm and the upright, and, next below Gamma, is the fourth magnitude star, Eta Cygni. The star which lies at the foot of the Cross is the third magnitude star, Beta Cygni, or Albireo, and it is one of the show objects of the heavens. It is made up of two stars, one a golden yellow, the other sapphire, so far apart that, although they appear as one star to the naked eye, they can be separated into two components even with a pair of binoculars. There are, of course, many beautiful double stars in the heavens with components of contrasting colors that are easily separated with small telescopes and that may be quite as beautiful as Albireo, but this star seems to be a general favorite with stargazers and it may be that this is due, partly, to its conspicuous position at the foot of the Cross. Albireo also marks the beak of The Swan, which is flying southward along the Milky Way. Deneb lies in the tail of the Swan. The cross-arm of the Cross, marked from east to west by the third magnitude star Zeta Cygni, second magnitude

star, Epsilon Cygni, and the third magnitude star Delta Cygni, represent the outspread wings of the Swan.

The Southern Cross, it may be recalled, is small and compact, and outlined by only four stars, two of about $1\frac{1}{2}$ magnitude, which mark the upright, one of $1\frac{1}{2}$, and one of third magnitude, in the cross-arm. The Northern Cross, extending twenty degrees from top to foot and covering a space in the heavens nearly twelve times greater than that covered by the Southern Cross, has a long and straggling appearance and contains seven stars, one of the first magnitude, two of second, three of the third, and one of the fourth. Both configurations lie in brilliant portions of the Milky Way and have close to them "coal-sacks," or dark regions in the midst of dense star-clouds, that are believed to consist of vast

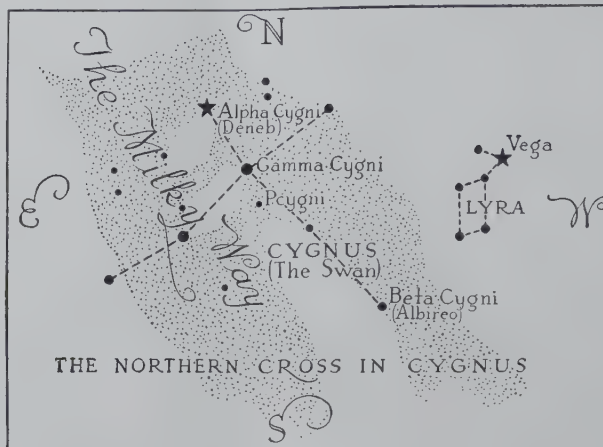
clouds of non-luminous, cosmic dust. These dark regions are particularly conspicuous in Cygnus. It is in this constellation that the Milky Way apparently divides into two branches which remain separated for fully one third of the entire extent of the Milky Way and run together again in Scorpio. It is even suspected that this long rift in the Milky Way is not a division into two branches but is a vast region of dark nebulae similar in nature to the smaller "holes" and "coal-sacks". There are also in Cygnus great irregular stretches of luminous nebulosity, such as the beautiful Net-work Nebula, of which there are many fine photographs taken with powerful telescopes. They are believed now to be dark clouds of cosmic dust illuminated only by the light of stars associated with them or excited to luminosity by radiations from these stars. Such a vast, nebulous region lies not far distant from the super-giant star, Deneb, at the top of the Cross.

It is in constellations such as Cygnus, Ophiuchus, Sagittarius, Scorpio, and others that lie in the densest and most brilliant regions of the Milky Way that peculiar and irregular variable stars are so often observed, as well as the spectacular outbursts of novae or temporary stars that suddenly increase in brightness many thousand-fold and flash forth for a short period of a few days or weeks as brilliant stars easily visible to the naked eye, where only a faint telescopic star had formerly been. Three such outbursts of novae have been recorded in Cygnus. The $4\frac{1}{2}$ magnitude star, P Cygni, which has remained at this brightness unchanged for many years now, suddenly appeared in the year 1600 as a star of third magnitude where no star had been visible before. Another nova, Q Cygni, appeared in 1876. It also attained the brightness of a third magnitude star. A third nova appeared

in Cygnus in 1920 and suddenly increased from below the fifteenth magnitude, at which it would be visible in only the most powerful telescopes, to a star of second magnitude. Both of these novae are now invisible to the naked eye. A remarkable star in this constellation is known as SS Cygni. This star goes through most unusual and puzzling light changes in a manner that suggests that it may have been at one time a nova. Normally faint, it

brightens up suddenly at irregular intervals, only to drop back again to its former state in a short time. Many thousand observations of this star have been made in an attempt to solve the mystery of its strange behavior, but so far no satisfactory explanation has been forthcoming.

It is believed that the Milky Way regions in Cygnus are comparatively near and that the dark



nebulae that are so conspicuous in this constellation are probably not much more than 600 light years distant. In the northern hemisphere the Milky Way is at its brightest in Cygnus and Aquila, and in the southern hemisphere in Scorpio and Sagittarius. It is now conspicuous in the evening hours extending from Perseus, on the northeastern horizon, diagonally toward the southwest through Cassiopeia, Cepheus, to Cygnus, in the zenith, and then in two branches to Scorpio, one through Aquila and Sagittarius and the other through Ophiuchus. The small constellation of Sagitta, The Arrow, between Cygnus and Aquila also lies directly in the path of the Milky Way. It is hoped that the Northern Cross will be more appreciated by those who study the heavens.

Sagittarius, easily recognized by its small, inverted, milk dipper is now visible in the southwest, close to the horizon, while Scorpio is partly below the horizon.

Among the planets, Mercury is an evening star throughout the entire month and will reach its greatest elongation east of the sun on September 23, but the fall elongations are not the most favorable ones for observing the planet in the evening, as the ecliptic is then at its least inclination to the western horizon.

Venus will be in inferior conjunction with the sun on September 8 and will be too close to the sun to be seen this month. Mars is now far over in the southwest at sunset and sets about three hours after the sun. Jupiter is not far from Mars and is also low in the southwest at sunset. Saturn is now in fine position for observation most of the night. It is a few degrees above the eastern horizon in Aquarius at sunset. On September 23 at 6:39 P.M. Eastern Time the sun will cross the equator going south and autumn will begin in the northern hemisphere.

Trailside Treasures

SNAKES AND FAIRY JEWELRY

By JANE ADAMS PARKER

WHEN Jake, the Snake Man, stepped out of the truck before Trailside Treasure House, he found three excited children waiting for him.

"We have something up in Treasure House to show you," said Jerry. "Come on up."

"See," said Jo, when they had gone up into the museum, "we painted pictures of our snakes, in the right colors, and wrote down the things we found out about them."

Jake looked quite interested at the row of cards tacked on the wall.

"Those are mine," said Jerry, pointing to the first two.

"Card one." Jake began to read: "Common Water Snake. Color: Brown with broad cross-bands of reddishbrown; underneath, yellowish white with bright red spots, and patches; older ones, sometimes dull brown, almost black; young ones, gray,

with blackish cross-bands. Food: frogs and fish. Length: Two to four feet.

"Card two. Brown Snake, DeKay's Snake. Color: Brownish gray, with row of small black dots in pairs, along the back; sometimes, a broad pale stripe down the back; underneath, pinkish white. Food: earthworms. Length: about one foot."

"And those are mine," said Jo, "next to Jerry's."

"Let's see," said Jake, "this one says, 'Card three. The Striped or Garter Snake.'"

"I took that one," said Jo, "because you said it was so common around here. And I thought it would be fun to watch for it in our woods."

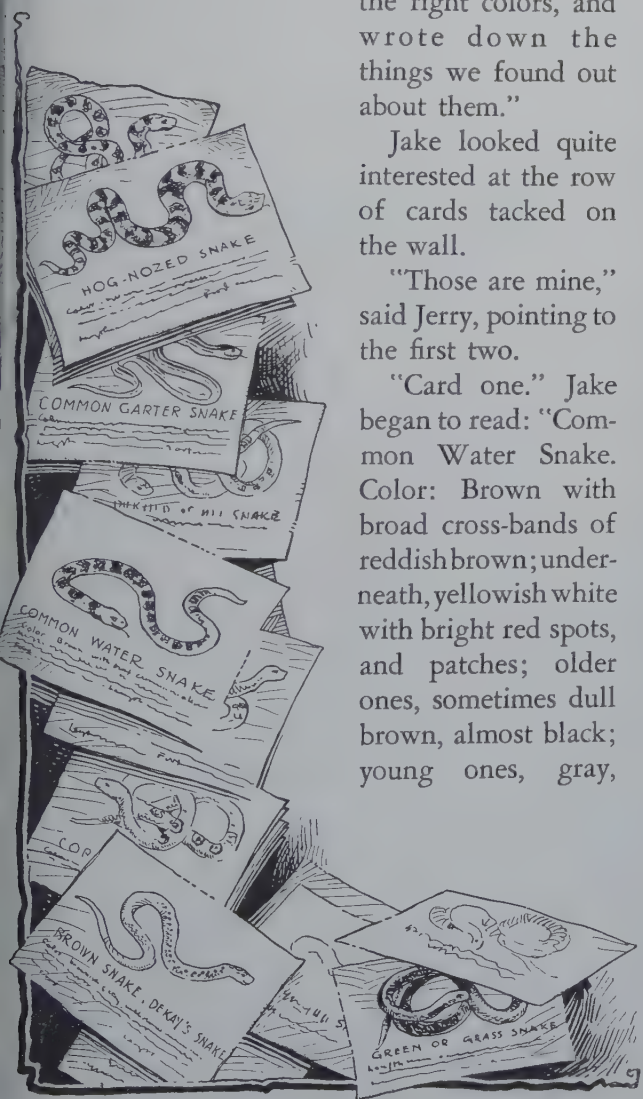
"You get to know the different snakes when you meet them," said Jake. "Almost like saying 'Howdy,' to an old friend. Common Garter Snake," he went on reading. "Length: two and one-half to three feet. Color: Dark brown or black with three yellow stripes down the back; underneath, greenish yellow. After eating, when his sides swell out, the skin shows pale greenish spots like a checkerboard. Garter Snakes like the water too. Food: Frogs, toads, tadpoles, salamanders and earthworms.

"Card four, The Ribbon Snake," read Jake. "I know that's just another Garter Snake," said Jo. "But he's so long and dainty. See, it says: 'Length, about one yard, and only about one half inch across the body. Is found in swampy places or in streams. Color: Dark brown or black with three bright yellow stripes down the back. Food: Tadpoles and frogs, and small fish.'"

"Card five," said Jake, looking over his specs at Rosy, "and this was the little girl who hated snakes."

"I don't now," said Rosy, laughing.

"Well let's see what your cards say. Card five, Hog-nosed Snake. Length: About eighteen inches to three feet in some regions. Color: brownish, with dark brown cross-bands. Food:



Toads, mainly, and sometimes frogs.

"Card six, Green or Grass Snake. Length: Not over two feet at most. Color: Green above and whitish beneath. Food: Grasshoppers, crickets, some moths and other insects; young eat small spiders."

"Well, I think that's pretty nice," said Jake, smiling at the children. "And if you take these cards with you when you go treasure hunting it'll help you to recognize your friends. Now, let's see what Ben carried upstairs for us in this box."

Jake took the big box from Ben as he spoke and, setting it down before the children, opened the lid, and took out a long snake about five feet or maybe a little over. "Color," he said, as if reading one of the cards, "gray with large blotches of crimson, bordered with black. Sometimes tan or reddish, and there are smaller blotches on the sides; underneath, white with large black squares. He's a

Corn Snake, and to me one of the most beautiful of our snakes. He goes into the corn fields to eat the rats and mice. And some farmers, too many of them, often kill him for a dangerous reptile, when he is very, very valuable for the help he gives us. Really, children, there is so much to learn about snakes; but keep on going. That's the only way."

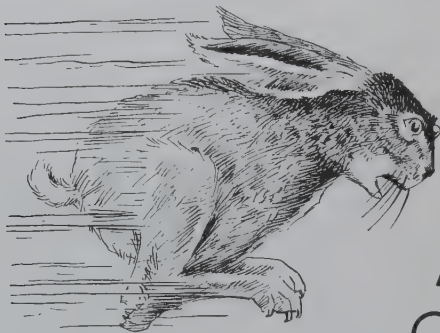
"And here's something I found hanging on a bush when we were out treasure hunting," said Joe. "I call it fairy jewelry. Isn't it pretty? It's a little green and gold cradle, Aunt Dot says, with a little baby in it. But she won't tell us what it is until it comes out."

"Maybe the next time Mr. Jake comes to visit us he'll be able to see it," said Aunt Dot.

"I surely will be anxious to get here, then," said Jake. "Until then good-bye and keep on going and remember. That's the only way to learn."

(To be continued.)

HOW THE TERRAPIN BEAT THE RABBIT



A Cherokee Indian Myth

Retold by

DOROTHY E. PLETCHER

"I CAN easily beat you in a race," said the boastful Rabbit to the Terrapin one day.

"Don't be too sure of it," replied the Terrapin. "Shall we really have a race to see which of us will win?"

"Yes, oh yes," said the Rabbit, wriggling his nose and laughing to himself, for he was sure that the turtle moved far too slowly to win a race. So they named a day for the race and agreed to run across four mountain ridges. The one who crossed these ridges first would be the winner.

"Since you can never, never win the race," said the Rabbit to the Terrapin, "I'll let you cross the first ridge before I begin to run."

"That will suit me," replied the Terrapin. He then went home and called in his Terrapin friends. He told them he knew he could not run faster than the Rabbit. Then he explained to them his plan to end the Rabbit's boasting.

All the animals came to see the race. The Terra-

pin went ahead toward the first ridge as the Rabbit had suggested. They could hardly see him on account of the tall grass. The Rabbit leaped off at the signal, thinking he would win the race quickly.

Imagine his surprise when he saw the Terrapin going over the ridge ahead of him! What big jumps he would have to make to catch up! Hippity hop, hippity hop he went. But there was the Terrapin going over the third ridge, away ahead of him! He could hardly believe his eyes. He puffed and he blew as he scampered along. But he just couldn't catch up with that Terrapin. And so it went until the Rabbit saw the Terrapin cross the fourth ridge and win the race.

And weren't all the animals surprised? How they did chatter. "How could the Terrapin ever have beaten the Rabbit?" they asked one another.

This is the way the Terrapin did it. As all the Terrapin's friends looked exactly alike, he placed one near the top of each ridge. He told each one

to wait until the Rabbit came in sight, and then climb over and hide in the long grass. When the Rabbit appeared he could see no one on account of the tall grass and thought the Terrapin was

ahead. The real Terrapin sat on the fourth ridge so that he could walk right in at the end of the race. Do you think the sly Terrapin's trick cured the Rabbit of his boasting?

THE INSECTS' BANQUET

By J. FRANCIS ZABEL

One late afternoon while enjoying a stroll,
We witnessed a scene that appeared on a knoll,
On the smooth shaven grass by the side of the wood,
Beneath a broad oak that for ages has stood.

We saw first the Beetle so blind, and so black,
And with him his friend, the Ant, on his back;
And there was the Gnat and the Dragon-fly too,
With all their relations, green, orange and blue.

And then came the Moth in his plumage of down,
And the Hornet in jacket of yellow and brown
Who with him the Wasp, his companion, did bring,
And both made to promise to keep back their sting.

A mushroom their table, and on it was laid
A large round leaf, which a tablecloth made;
The viands were varied, to each of their taste,
And the Bee brought her honey to make some good paste.

Over there on his haunches, so solemn and wise,
The Frog from a corner looked up in surprise;
And the Squirrel well pleased such diversion to see,
Sat cracking his nuts, overhead in a tree.

Then out came the Spider, with fingers so fine,
To show his great skill on the tight-rope line;
From one branch to another his cobwebs were laid,
And strong, so he thought, as anything made.

But just in the middle, Oh! shocking to tell!
From his rope in an instant, the poor Spider fell;
Yet he touched not the ground, but with talons outspread,
Hung suspended in air at the end of a thread.

The Cricket then came, with a hop and a spring,
Quite long was his leg, though short was his wing;
He took but three leaps, and was soon out of sight,
And chirped his shrill praises the rest of the night.

With step so majestic, the Snail did advance,
And promised the gazers a minuet dance;
But all laughed so loud he pulled in his head;
In his own little chamber he went off to bed.

As evening gave way to the shadows of night,
Glow-worm, the watchman, came out with his light;
Then home let us hasten while yet we can see,
For no watchman is waiting for you or for me.

Cygnus, The Swan

By JEAN H. BROWN

A beautiful swan goes sailing by,
Sailing by,
Up in the sky.

It sails on a stream of misty light,
In the deep dark night.
With wings outspread,
Far overhead,
It sails the milky way,
On light wings,
On bright wings,
Through white star-spray.



Hiking and Camping Forum

Conducted by
ERNEST A. DENCH

Hiking and camping inquiries will be answered by mail if a stamped, addressed envelope is enclosed. Address the Forum Editor. This Forum is dedicated to the Seventh Appalachian Trail Conference, held at Skyland, Virginia, and the Hosts, the Potomac Appalachian Trail Club, Washington, D. C.

7th A-T Conference Sidelights

There were one hundred and thirty delegates from thirteen A-T clubs and sundry miscellaneous organizations. The hosts, the Potomac Appalachian Trail Club, hereinafter to be known as PATC, had a turnout of sixty-three. Next largest representation, Natural Bridge A-T Club, was eight. . . . A modest delegate, identity known only to Myron Avery, voluntarily came forward as the financial "angel" for the *Guide to the Southern Appalachians*. This book, long needed to complete the A-T series, already exists in manuscript form. . . . Forum editor became restless at so much talk about man-hours in trail-clearing work. The morning was saved when the last two speakers gave a thought to their co-workers, the ladies. . . . Roughness of A-T grades in terms of average walking time per mile: Maine 26 minutes, Pennsylvania 22 minutes, Virginia 18 minutes. . . . Delegates are still looking for a Grade A trail. Attempts were made to ascertain what government agency used this designation, but all disclaimed ownership. Could the unknown author be in the dairy business? . . . During 1936 the A-T Conference will offer four classes of membership: *Class A*, trail maintenance groups; *Class B*, organizations interested in the A-T; *Class C*, independent individuals willing to undertake trail maintenance; *Class D*, open to persons desirous of regularly receiving the A-T publications. . . . Board of Managers, elected for a two-year term, are: Major William A. Welch, Honorary President; Myron H. Avery, Chairman of the Board; Frederick W. Schuetz, Treasurer; Harlean James, Secretary. Each regional division also has its own Board of Managers.

A-T Head Men

"Every undertaking needs both a dreamer and a practical man," observed a delegate relatively new to organized hiking.

Benton MacKaye, the Dreamer: "The Appalachian Trail should be real or absent—genuinely wild or nothing. The use of a mountain highway to reach Skyland is inconsistent with our objective." (Extract from his paper read at Skyland.)

Myron H. Avery, the Practical Man: Whole-hearted cooperation with federal and

state agencies to ensure replacement of the A-T interfered with by highway developments; the tackling of unlinked areas in the Maine wilderness and the Unaka National Forest in Tennessee, and obtaining a liberal distribution of lean-to shelters on government lands.

His own club, the Potomac Appalachian Trail Club, has suffered much from eradication of its own trails and shelters in the Shenandoah National Park. Instead of whining about their losses, Avery and his associates are getting action from the National Park Service.

Both head men have their critics, as is to be expected.

At no time has the Appalachian Trail wholly been a wilderness route. It is impossible to secure more than 2000 continuous miles of undeveloped country in the East. The A-T is obliged to cross main highways, traverse secondary roads, cut across country estates and farms, and occasionally use other developed areas, such as the Bear Mountain Bridge across the Hud-

son. This is better than swimming the river.

Few will ever have the desire—or the time—to travel the entire trail from Maine to Georgia. Practical considerations require accessible entrances and exits for the one-day hiker and the vacationing hiker-camper.

In northern Virginia, where the Shenandoah National Park is being developed, the A-T is now little more than a combination of pedestrian sidewalk and equestrian path paralleling the Skyline drive. Its graded surface and easy slopes are unlike the old.

Fortunately, the Northern Blue Ridge has many spurs reaching into remote back country, where the PATC has resourcefully developed an extensive side trail system. Here will be found one of the most zestful rock climbs—Old Rag Mountain. Here, too, is one of the stiffest climbing grades—Knob Mountain, 360 degrees instead of the tame 25 degrees of the A-T in my sector.

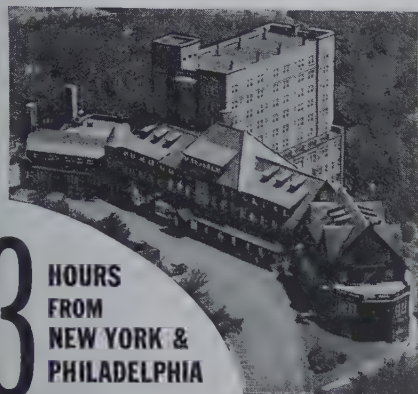
Even now it is better to travel the A-T than pound the Skyline Drive for miles, and suffer the hazards of passing cars. Let's
(Continued on page 188)



"ON WEVERTON BLUFF", A PICTURE FOR WHICH FIRST PRIZE WAS AWARDED TO G. F. BLACKBURN, POTOMAC APPALACHIAN TRAIL CLUB MEMBER, AT THE SEVENTH APPALACHIAN TRAIL CONFERENCE AT SKYLAND, VIRGINIA

"NO WOODS more full of song"

—Henry Van Dyke



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Outline of Science

Surrounded as we are today with the multiple manifestations of the progress of scientific knowledge and its application to our daily life, there is a wide lay interest in the foundation upon which this scientific progress is built. Most of us cannot hope to delve into the intricacies of atoms and radiation, spectrums and relativity. With many the recollection of physics and chemistry courses in school is dim and out-dated. Yet every intelligent person likes to have some understanding of what is back of many items of scientific achievement. Such a background is supplied by J. W. N. Sullivan in his book *Science, A New Outline*. Concisely and simply the author has brought us up to date in this field; brought together related proved facts in the field of science; given us a general knowledge with which to understand new developments. The publishers are Thomas Nelson and Sons, New York, and the price is two dollars.

Fall Lawns

There are two good seasons in which to sow grass seed, authorities say. One is late August and early September. The other is early spring as soon as the frost is out of the ground and the soil is dry enough to be worked.

Fall seeding, however, has several advantages over spring seeding, particularly in the northern half of the United States. Weather is more favorable to planting in the fall. Grass seed germinates more quickly and, with proper plant food, the grass will develop strong roots before winter comes and grow during the spring into a thick, beautiful turf.

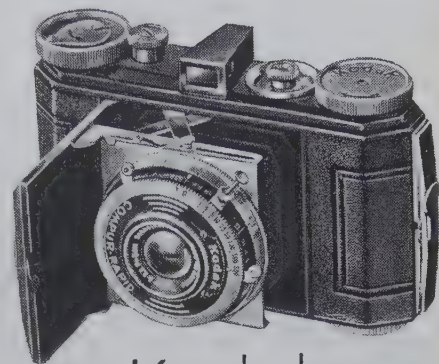
Here is the method recommended by expert gardeners as the easiest, most economical method of making your new lawn now. Prepare the seed bed by spading or plowing; then cultivate the ground into a pulverized surface, free of lumps. Before planting the seed, rake lightly but thoroughly into the soil four pounds of complete plant food to every hundred square feet. Then sow good grass seed of a variety suitable for your community. Your local seed dealer's recommendation will be reliable as to the best mixture for you to use. Sow the seed evenly, then roll the surface lightly to bring the soil in contact with the seed. Water the soil frequently, using a fine spray until the grass is big enough to mow.

The amount of plant food you have applied will be sufficient to assure the grass in your lawn a square meal during the fall season. It will enable the grass to develop a strong root system before winter comes, the best insurance you can have against winter killing.

New York Parks

New York State may well be proud of its splendid system of State Parks that represent a valuable conservation and recreation asset. Seventy parks comprise the system and extend from Lakes Erie and Ontario to Long Island. Full details with respect to the Parks, the location, facilities and character have been assembled in an attractive pamphlet entitled *New York State Parks*. This booklet is distributed by the State Council of Parks, State Office Building, Albany.

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Hiking and Camping Forum

(Continued from page 186)

be charitable and regard the A-T as the main gateway to blue-blazed side paths that really chase away the blues.

A-T Maintenance

At present twenty-five clubs each maintain from four to 225 miles of the A-T, which now totals 2056.86 miles. The smallest mileage unit belongs to the Inkowa Outdoor Club of New York. The largest piece is entrusted to the PATC.

Next in line, with a quota of 181 miles, is the newly-formed Maine Appalachian Trail Club. Myron H. Avery has long wrestled with the difficult problem of the Maine wilderness—over 250 miles of A-T, and no large cities from which to draw workers. This new unit, headed by Walter D. Greene, is restricted in membership to those who have rendered distinguished service to the good cause of the A-T in Maine.

Not included in the A-T mileage maintenance quoted above are the sectors entrusted to individual workers, and state and federal organizations. Uncompleted links, or those where the maintenance problem is acute, are 70 miles in Maine, 87 miles in southern Virginia, and 123 miles in the Unaka National Forest, Tennessee.

Trail Working Manual

The opening chapter of *Appalachian Trail Technique* takes us back to the early days of trail-making in eastern America. The first club trails were constructed by the Appalachian Mountain Club in the White Mountains during the late 'seventies.

Paint is pushing the metal marker into the background today, while titanium oxide is gradually replacing other kinds of paint. Blazing tips and sign-making instructions are given in this practical manual, which concludes with a list of trail-clearing tools and equipment and sources of supply. Twenty cents is the copy price asked by the publishers, Appalachian Trail Conference, 901 Union Trust Bldg., Washington, D. C.

PATC Trails

The PATC is conscious of the recreational importance of side trails in the Northern Blue Ridge. They total about 200 miles—a big job when the 225 miles of Appalachian Trail maintenance are added.

It is not a paper mileage. The Forum editor sampled some of these side trails after the Conference, and found them in excellent shape. The following week-end he unexpectedly met five separate working parties in as many sections.

The PATC has 58 trail sections entrusted to 44 overseers, who have a varying number of assistants. And 15 of these overseers

are women. The reason for such industriousness is not hard to understand after you have met Dr. J. F. Schairer, supervisor of trails. You witness the dreamer in him when he stands on some lofty summit and vividly describes the characteristics of the surrounding high spots. He quickly changes to the practical man of action when he enthusiastically praises the work such and such a crew did in a tough scrub oak section.

These energetic lads and lassies cover considerable distances to reach their respective trail assignments from Washington—from 60 to 100 miles each way. They believe that trails, once completed, should be made known to all who enjoy walking. Painted signs are posted in conspicuous places, giving the trail name and the terminal-to-terminal mileage. What amateur sign painter can equal the record of Dr. L. F. Schmeckebier—3800 PATC trail signs in six years?

At Thornton Gap, where the Lee highway and Skyline drive branch off, the PATC has erected a sign which proclaims that—"The Appalachian Trail is a mountain foot-path extending from Maine to Georgia. For information apply to the PATC (address follows)."

Contrast this with one leading eastern trail center. Trails with terminals on the town outskirts are deliberately concealed at such locations. The first paint blaze or metal marker will be found some distance inside the entrance, instead of facing it. The intent is to discourage picnickers and motor campers. Some of these people, normally afraid to venture far into the woods, might acquire this confidence with the aid of adequate signboard directions. Such sampling might, in time, foster a genuine desire for hinterland hiking and camping.

Paint Blaze Technique

Egbert H. Walker, PATC map authority, has completed a five-year research on the application of paint blazes to different types of trees. The supposition was that paint "took" better on blazed trees, but Walker found otherwise. Paint can be applied to smooth-barked trees without blazing. On rough-barked trees all the worker needs is a simple little gadget, commonly used by painters, known as a scraper. It costs 25 cents in a hardware store. The rough surface is lightly shaved before applying the paint. The work can be done by a one-man crew instead of two. Such paint blazes possess increased visibility and endure for a longer period.

Blue Ridge Shelters

No whimperings came from the Washingtonians over what the CCC had done to two of their shelters. The Sexton shelter is closed because use of it might contaminate the CCC water supply. A new CCC camp is being built about a quarter of a mile from the Range View shelter, the fate of which is undetermined.

Forum editor and friends spent a comfortable three days at Range View. The two-tier bunks are named after nearby scenic points. Although he occupied "Mary's Rock," it belied the last part of the name. We found all the blankets we needed, had plenty of fresh air through the liberal number of windows in the lofty interior, while

the cupboards and shelves were well stocked with cooking appliances, household utensils and emergency foods. The outside fireplace, built under the extended roof, is a convenience in wet weather. Plenty of wood in reserve and plenty more for the fetching and chopping. As the shelter is located in a cow-grazing area, the spring is protected with a wooden corral.

The PATC has been suitably compensated for the loss of Sexton, which will be reconstructed near Hawksbill Mountain—a moderate day's hike from the middle shelter, Meadow Spring. The park service also promises a liberal number of open lean-tos along the A-T in the Shenandoah National Park.

PATC Literature

The PATC has an equally prolific and invaluable indoor crew, engaged in writing, editing, mapping, processing and research. Typical of this publishing activity was the thick envelope each Conference delegate received at Skyland with the compliments of the PATC. The contents were:

Supplement to Guide to Paths in the Blue Ridge, price 25 cents, and intended for use with the complete guide, which costs \$3.00.

List of Camping, Hiking and Trail Making Equipment, fifth edition, 36 pages, price 20 cents.

July issue of the *PATC Bulletin*, a printed quarterly of 24 pages keeping one informed of hiking conditions in the Blue Ridge. Subscription is 60 cents yearly. Two loose maps and the Conference program. PATC headquarters are at 609 American Security Building, Washington, D. C.

A Trail Historian

The Historian is not a perfunctory office in the PATC. They even have a new name for it—Trail History Editor. Miss Jean Stevenson gets around Virginia and Maryland quite a bit. She loves to consult musty old records in country town libraries, courthouses and historical shrines. The human interest element plays its part in her work, by discussions with old inhabitants. Today there isn't much members do not know of the historical features of their hikes, thanks to Miss Stevenson's thorough researches. Her latest article, *Skyland Before 1900*, in the *PATC Bulletin*, was absorbingly interesting to Conference delegates.

Youth Hostels Expand

In his quiet but convincing way, Monroe W. Smith outlined the Youth Hostel expansion plan to the A-T Conference delegates. Last spring ministers in rural sections of New Hampshire and Vermont were asked to recommend desirable farmhouses for temporary hostels fifteen miles apart. Each minister submitted the undertaking to farmers of good character, particularly those who were none too well off these times.

When approved, the farmer and his good wife become the House Father and Mother, collect the 25 cents per person overnight lodging fee, and take a 20 per cent profit on the community store they are required to operate in conjunction with the hostel. Outing groups using hostels, in which they prepare their own meals, summarize the

(Continued on page 190)



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Is the child mature, average, or immature for his age?.....

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If not, what type of training do you wish him to have?.....

Name.....

Address.....

ANIMALS OF THE AUSTRALIAN BUSH

(Continued from page 140)
 inhabits one tree, and the sight of these exquisite little creatures emerging one by one from their nesting hole at dusk, climbing to a point of vantage, and volplaning to a neighboring tree, is one of the most beautiful experiences in the bush.

The sugar squirrel takes kindly to captivity and breeds freely. Two young are generally reared each year. The food of the lesser flying phalanger consists chiefly of insects, but, like most of the marsupials, it is also fond of sweet foods, particularly of honey. In captivity it will also take cake, jam, nuts from which the husks have been removed, and cooked meat.

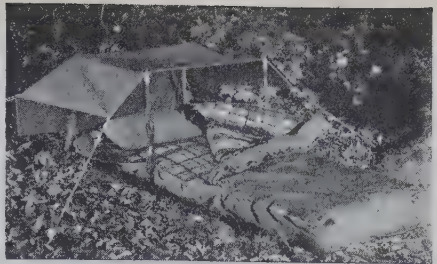
Representing the insect-eating shrews of the Old World are a number of beautiful little mouse-like marsupials known universally as "pouched mice", for like most of the other marsupials, they carry their young attached to the teats in pouches. In some of the pouched mice, however, these pouches are so reduced that they never completely cover the young, which may be very numerous. In others however, they are well developed and form an adequate protection for the delicate young.

Although they are extremely mouse-like in habits and in general appearance the Phascogales are at once distinguished from Rodents by a glance at their teeth—which are modified for an insectivorous diet—or by their feet.

One of the largest and handsomest of the group—the brush-tailed pouched mouse, or rat, as it is sometimes called is said by bush dwellers to kill poultry, but its usual diet consists of insects and, more rarely, small mammals and birds. The case against the beautiful little mammal, like that against the native cat, has not yet been proved. In color it is dark gray, and is distinguished at once by its tail, which is covered with long black hairs that stand stiff and erect in moments of excitement, like the bristles on a bottle brush. It is arboreal, and is so active and graceful in its movements as to make it one of the most beautiful of Australian animals. Indeed, anyone who has not seen these animals in a wild state can form no idea of their true characters.

In the grasslands, and in dense undergrowth throughout Australia, as well as in more exposed situations, are a number of species of curious terrestrial animals known as bandicoots. The long-nosed bandicoot is one of the most abundant species in south-eastern Australia. It is about the size of a rabbit, and constructs a large domed nest in dense grass and fern. There are usually four young at a birth, and these, as soon as they are large enough to leave the shelter of the pouch are the most entertaining little creatures imaginable. They are inquisitive, investigating every strange object or unaccustomed smell with their long, sharp, sensitive nose, running to the shelter of the mother's pouch at the least alarm.

These then, are some of the archaic animals—the marsupials or pouched mammals—that you would encounter if you were transplanted suddenly to the Australian bush. It has not been possible in so brief a survey to speak of any but the more familiar—or the bizarre—of Australian mammals, but these will perhaps suffice to show that Australia is a land of living fossils!



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Hiking and Camping Forum

(Continued from page 188)

average meal cost per person as ten cents.

This coming fall the AYHA embarks on the publishing sea with the *Youth Hostel Knapsack*. Northfield, Mass., is the mail address of the American Youth Hostel Association.

Gadget Parade Continues

No. 1. A leaflet, *Training Diets*, and a booklet, *Fruits That Help Keep the Body Vigorous*, may prove of guidance to hikers and campers who wish to keep in the pink of condition both during and in between trips. Literature is free.

No. 2. Nobody stooping in swinging this tool along overgrown trails or on the grounds around camp. Weighs only two pounds, and can be wielded with one hand or both. Is especially effective on annual growths, but blade needs frequent sharpening for the best results.

No. 3. A portable refrigerator which uses dry ice. Its weight, 33 lbs., limits use to those campers traveling by car to their base. Retail at a nominal price by a firm specializing in insulating devices for perishable food manufacturers.

No. 4. Improvements on an existing snake bite kit are decidedly in the purchaser's favor. He gets an unbreakable suction pump, a deeper and less painful skin sterilization preparation, ammonia inhalants for fainting or shock, a tourniquet of extra heavy webbing (with buckled ends like a belt), adhesive compresses, and a lancet (fashioned à la fountain pen). Outfit fits a pocket-size metal box.

No. 5. An inexpensive sun shelter which may be quickly set up where shade is needed. Structure consists of green painted poles, metal supports and gayly-colored awning. Easily fastened to the car running board or placed inside. Can be readily converted into a portable bathhouse or a child's play tent with extra curtains.

No. 6. A powdered fruit drink made in several flavors, each packed in a small carton. Pre-sweetened; needs only addition of water.

No. 7. A beekeepers' supply house sells a head net as a mosquito protection. This green mesh "veil" has an isinglass front to increase visibility. Is worn over an ordinary cap or hat, and folds up when not in use.

No. 8. A prominent publisher offers a catalog of 40 pages devoted to outdoor books.

Further particulars, including names and addresses, of the above products or services are given on a mimeographed sheet. Please enclose a stamped, addressed envelope with your request for it.

Hardening Your Feet

To prevent blisters insert an ounce of

tannic acid powder (your druggist has it) in two quarts of water. Soak your feet six times for fifteen minutes before any extended trip. As tannic acid is used in tanning leather, the effect on the skin will be obvious. The above advice, given here by courtesy of the Potomac Appalachian Trail Club, appears in the bulletin of instructions for the Maine trip which Myron H. Avery is conducting August 23-September 6.

Vermont's Long Trail

It takes 120 pocket-size pages, set in small but legible type, to tell the hiker all he should know about the Long Trail, 260 miles from the Massachusetts line to the Canadian border. Regional maps are included. The Green Mountain Club (Rutland, Vt.) may well be proud of this tenth edition of the Long Trail Guide Book, price fifty cents.

Oranges and Lemons

The seasoned camper, when short of certain ingredients for a balanced food combination, knows what it is to be resourceful. There must be a camper on the staff of the California Fruit Growers Exchange to have devised the following practical tips and recipes:

A speedy salad dressing for use with mountain stream watercress can be made with lemon juice, salt and pepper.

For a full-flavored dessert, cut up pieces of orange or lemon peel and toss them in the mess of dried fruits you are stewing for the next meal.

Chilled orange or lemon juice for supper is possible by placing the fruit in the bed of a cold mountain stream or woodland spring. Do this in the morning just before vacating camp for the day's hike.

A hurry-up dessert for the evening meal, when returning to camp late, consists of sliced oranges sprinkled with sugar. Better yet, the orange slices can be mixed with shredded cocoanut, or blended with chopped dates and seedless raisins.

Lemon juice will do the sour milk trick for those biscuits or pancakes best made that way. To sour a newly-opened can of evaporated milk, add lemon juice in the proportion of ¼ cup of juice to one cup of milk.

A Meat Broiling Gadget

W. W. Cady does a lot of camping while scouting the projected Long Path of New York, which is to extend from Manhattan's back door to Lake Placid. He kindly contributes a gadget for broiling meat over a camp fire.

You leave civilization with a small spool of fine wire. At the camp site cut a forked stick with prongs 10-14 inches apart. Fasten wire near the end and wind around the fork, 1-2 inches apart.

Should a forked stick not be available, gather a couple of bent sticks, and wind a little wire around the handle part. These sticks, when squeezed together near the crotch, will evolve a shape-retaining fork. The larger or hotter the camp fire, the longer the handle should be. Burn or bury the gadget on breaking camp, lest it accidentally trap small animals.

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A Novel Kit

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Indiana Audubon

As usual the year book of the Indiana Audubon Society contains much interesting information on the birds of that state as well as valuable data and field notes. When it comes to hand we are always interested to see what Dr. Earl Brooks of Noblesville, Indiana, president of the society and editor of the year book, has added to his miscellany on robins. Dr. Brooks has been assembling notes from everywhere about robins—strange nesting places, idiosyncrasies and events affecting robins. The issue this year is dedicated to Dr. T. Gilbert Pearson, president emeritus of the National Association of Audubon Societies. Extra copies are available at one dollar from Harold A. Zimmerman, 915 West Gilbert St., Muncie, Indiana.

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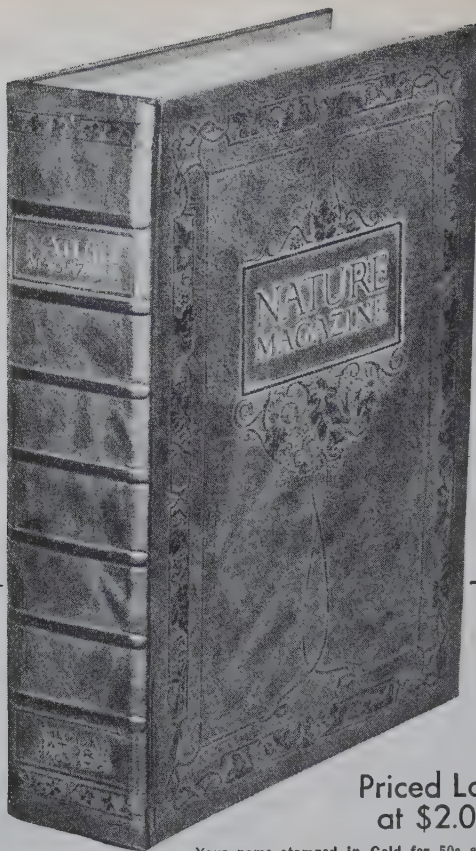
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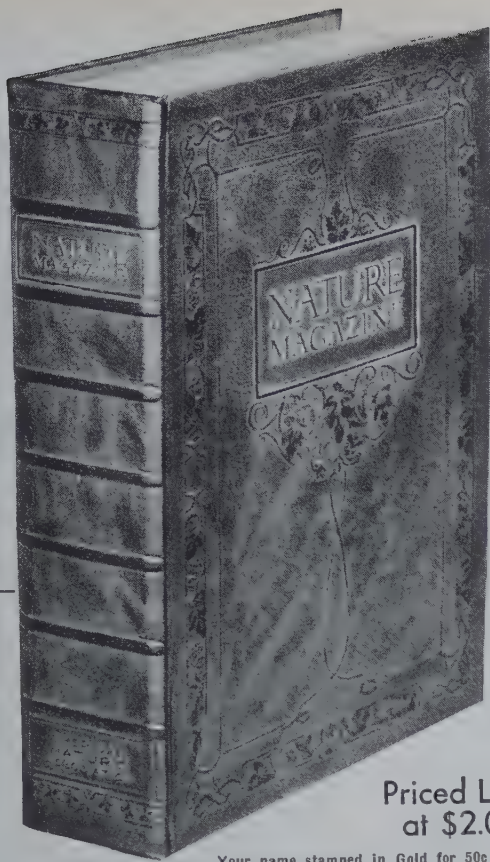
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Photographic Notes

BY SAMUEL BROWN

Autumn Photography and Color Movies

October and November bring with them one of the most beautiful seasons of the year—Autumn. The woods are a blaze of color, as are the new fall flowers, and the lakes, rivers and brooks reflect this pageant. Autumn brings a new paradise to the Nature photographer.

Autumn beauty can only be photographed successfully by employing proper methods. Ordinary color-blind film cannot render, in monochrome, the colors in foliage, but by using super-sensitive panchromatic film, it is easy to retain color values.

To get full values of color, a color filter is necessary. The K-1 filter is pale yellow and is intended for use only where short exposure is of more importance than full correction. The K-1½ is somewhat darker and gives better correction. The K-2 is a still darker yellow and gives practically full correction with panchromatic films. If, for any special purpose, perfect correction is required, then a filter which cuts out a small amount of red must be used. Such a filter is the X-1. Following are the factors for Panatomic and Super-Sensitive Panchromatic films when used with the filters mentioned: K-1, 1½; K-1½, 1½; K-2, 2; X-1, 4.

Whenever clouds are present in an autumn scene, they can be recorded by using a sky or graduated filter. This filter is half yellow and the other half clear. When attached to the lens, the filter should be so placed as to bring the yellow part at the top. The sky will thus be photographed through the yellow part and the landscape through the clear part. No increase in exposure is necessary. This filter should *not* be used to take the place of a general purpose filter.

The soft, yellow, natural light during the early morning and late afternoon hours is the ideal time for interesting autumn effects. One advantage in photographing during these hours is that a filter is unnecessary as the yellow light acts for this purpose. In addition, the most interesting lighting effects are prevalent. Somehow, long shadows, especially of tall trees, give a feeling of the real October.

* * *

For the amateur motion picture enthusiast, this writer knows of no more appropriate time to try out Kodachrome film. This color film has reduced movie making to the simplicity of black and white. Exposures for Kodachrome outdoors is exactly the same as for ordinary film except that the next largest stop must be used. No filters are required and the film can be used equally as well with standard, wide angle and telephoto lenses.

Projection of Kodachrome is the same as with regular film. Merely thread the film into any 16 mm. projector and your screen shows a picture, the brilliance of which is unequalled, in full color, without lines, pat-



"OCTOBER MORNING", A PICTURE TAKEN ON KODAK SUPER-SENSITIVE PANCHROMATIC FILM WITH KODAK SKY FILTER AT 1/25 OF A SECOND, F.11

terns or fringe.

We are giving below a simplified exposure guide for the enthusiast who wishes to try Kodachrome film.

Daylight Exposure Guide

- F. 1.9—Dark days. Also subjects on sunny days in dense woods or on heavily shaded porches.
- F. 2.8—Cloudy days with poor light. Also subjects in average shade on sunny days.
- F. 3.5—Sky completely overcast, but with good light. Also subjects on sunny days in open shade, lighted by a large area of sky.
- F. 5.6—Full sunlight; sun overhead or at an angle, causing shadows on subject cast by subject itself.
- F. 8—Full sunlight; sun behind the camera, giving flat lighting with distinct shadows cast behind the subject.

F. 11—Unusually brilliant sunlight without shaded areas—such as distant shots of beaches, marine scenes, and scenes in tropical sunshine.

(This guide should be observed between the hours of 9 A. M. and 4 P. M. during the summer months. Earlier or later in the day, use a larger diaphragm opening.)

Every amateur movie maker or anyone anticipating this branch of photography should have a copy of the small Kodachrome handbook. The manufacturers have sent a supply to this department and it is available free. Please send a stamped self addressed envelope.

Supplementary Lenses

The value and versatility of any camera, from the simplest box to the most expensive

outfit, can be more than doubled by the use of supplementary lenses.

The simplest form of supplementary lens is called a "portrait attachment." Fitted on box, single lens and fixed-focus folding cameras, it shortens the focal length of the regular lens slightly and thus permits taking pictures of close subjects. This lens is especially valuable in taking pictures of flowers because it allows approaching the subject as close as two feet. This results in a sharp and larger and more recognizable picture.

Proxar lenses are of the same type as portrait attachments but are of graduated degrees. When placed in front of the regular lens they shorten its focal length considerably.

As a rule, hand cameras can be focused only as close as six feet or, as in the case of the smaller cameras, three feet. By attaching a proxar to the front of the lens, the camera, with its ordinary short range, can be made to take sharp pictures of objects as close as one foot from the lens, according to the power of the proxar used.

When taking pictures of streets, in the open country or in the mountains, it is sometimes desirable to include objects to the right or left and above or below. With a normal lens, this is impractical because of the narrow angle of view which it covers. A proxar slipped upon the regular lens overcomes this difficulty by shortening the focal length and increasing the angle of view accordingly. When using proxars in this manner it is best to stop down the diaphragm opening to insure sharp results right to the corners of the picture area. Since the focal length is shortened, the regular lens is made faster and a corresponding exposure must be given when it is used. Proxars for this type of work can only be used on cameras which have a ground glass focusing screen to determine the shorter extension necessary.

Distars are the opposite to proxars in that they increase the focal length of the regular lens. Distars can only be used on cameras which have a double extension bellows to accommodate the longer extension necessary. To the Nature photographer this lens is especially valuable because it permits the taking of large pictures of distant views. A close approach to birds and animals is unnecessary when this lens is used. Distars come in various degrees of power. They take the place of telephoto lenses in cameras where the regular lens cannot be removed.

The last kind of supplementary lens is the type used on cameras of the Contax and Leica type, where the normal lens can be removed and replaced by another of a different focal length. These supplementary lenses, however, are complete in themselves, being of the finest and most fully corrected type anastigmats of various focal length. Regular lenses for these cameras are of about 50 mm. focal length and the supplementary lenses range from the wide angle 28 mm. to the telephoto 180 mm. lenses.

* * *

"Trade Hints"

One of the most important things in photography is filters. More so in Nature Photography than any other kind, because of the multitude of colors in flowers, foliage, autumn scenery, etc. With the proper use of filters, remarkably true renditions of color

in monochrome is possible. "Some Fundamentals in the Use of Filters" is a non-technical article for those who feel the need of a general outline of the subject. Write to this department for your copy and include a stamped self addressed envelope for reply. These are supplied through the courtesy of the Agfa Ansco Corp.

* * *

Correct camera settings in the range of low brightness levels where exposure problems are most critical may be obtained with a new photo-electric exposure meter of increased light sensitivity recently on the market.

The meter is said to give exposure data for scenes less than one-third as bright as that required to actuate earlier models, meeting the light conditions commonly encountered in photographing interiors, in home photography under artificial light, and in candid camera work.

The new meter is said to be more compact than previous models, and its reaction to light of various wave lengths is such that it is highly satisfactory for judging exposures for color photography. Write to this department for interesting article concerning this new meter.

* * *

Genuine plate embossing is accurate and easy with the Pragofot. Write for literature giving directions and prices.

* * *

With the ever increasing popularity of miniature cameras, development in fine grain has grown in major importance. Good fine grain development, because of the long time necessary in processing, is impractical without the use of a good developing tank. "The Nikor Anti-Fog Tank for Roll Film" is made of stainless steel and is entirely trustworthy. Write to this department for material describing the tank and directions for use.

* * *

"Profitable Photography with the Miniature Camera" by Edwin C. Buxbaum is a comprehensive little volume giving fifty profitable ideas for the miniature camera owner. A fine little book for the amateur who wishes to make his hobby pay. Published by the Box Tree Press, 1811 East Wood Place, Milwaukee, Wisconsin. Price \$1.00.

* * *

All who have any photographic problems or difficulties, or who wish to have negatives and prints criticised, are invited to correspond with this writer who will give his personal and prompt attention to each inquiry. Address the department editor. We wish all of our readers to take advantage of this service.

Cordially,
SAMUEL BROWN.

* * *

The photographic section of NATURE MAGAZINE is designed to be of service to its readers interested in photography, in particular Nature photography. All are invited to submit any problems or questions, which will be handled with dispatch. Any suggestions with respect to the conduct of this department will be welcomed by the editor.

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Sequoia Wins Tree Vote

After the avalanche of votes from all over the United States had been counted, the National Life Conservation Society found that 2,731,062 people had expressed their opinion as to the tree that should be declared the National Tree. Mrs. Charles Cyrus Marshall, president of the Society, announces that 788,115 votes were cast in favor of the Sequoia, the giant redwood of California; 754,756 votes for the American elm; 666,677 votes for the pine. Other trees receiving considerable favor in the voting were the black walnut, hickory, willow, locust, tulip tree and dogwood.

It is felt that the popular favor given to the great Sequoia was in large measure due to the fact that it is an exclusive American tree, growing nowhere else in the world. Also people who have seen the great trees carry with them forever a memory of their majesty and immensity. It is felt also that the elm lost some votes because of the Dutch elm disease now threatening the existence of this noble tree, much as the chestnut was destroyed by the blight.

The vote was close between the two favorites, and ballots were cast by adults and school children alike. Among the latter serious study was given to the various trees, and, in the course of the voting, much impetus was given to tree study and knowledge. The National Life Conservation Society and Mrs. Marshall are to be congratulated upon having successfully concluded such a tremendous and onerous task in gathering and tabulating these ballots, and in stimulating the interest in connection with this poll.

National Park Fauna

Fauna of the National Parks of the United States is the title of a recent booklet brought out by the National Parks Service as the second publication in its fauna series. The first publication dealt with a preliminary survey of the faunal relations in the parks and this latest booklet deals with developments in the administration of this important resource. It is the joint work of George M. Wright and Ben H. Thompson and it merits the careful reading and study of all interested in wildlife preservation. The booklet is available from the Superintendent of Documents, Washington, D. C., at twenty cents a copy.

Scottish Hiking

Ever since we learned by heart the first canto of *The Lady of the Lake* we have cherished an as yet unrealized desire to visit the highlands of Scotland. Now we can do it by proxy in *Walking in the Grampians* by Charles Plumb. Here is a volume that is more, however, than just a story of how and where he hiked and what he saw. That information is to be found, to be sure, but, in addition, the author supplies a number of sketch maps enabling the reader to plan a similar walking trip over the trails the author followed, or over any part of them. Some splendid pictures add to the allure of the text. Macmillan published the book and the price is \$2.50.

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A Lincoln Memorial

We quote from a little booklet, setting forth the purpose and plans for the Abraham Lincoln Memorial Garden, the following:

"An extensive park of almost 9,000 acres, 4,000 of which is a lake, has recently been completed at Springfield, Illinois, the Home and Final Resting Place of Abraham Lincoln. In this picturesque setting of hills, rugged shore line, and wide expanse of water, some forty acres have been set aside by the city for this memorial garden.

"From this site one looks across the water toward Lincoln's Home, his Monument, and the many places in Springfield sacred to his memory.

"The idea of this Memorial Garden was first suggested by a member of the Springfield Civic Garden Association, and after receiving the hearty approval of the city authorities and the Chamber of Commerce, the project was presented to the Garden Club of Illinois, which is now sponsoring the undertaking.

"The enterprise has also been endorsed by the National Council of State Garden Clubs, and by Lincoln students.

"It is hoped that the thought of the various states, through their federated gar-

den clubs as well as that of other countries and individuals, will be expressed in this living memorial. Some have indicated a wish to express themselves in a grouping of shrubs and trees, others by bronze tablets recording the utterances of Lincoln, while still others would like to place seats where visitors may rest in the quiet of the great out-of-doors and meditate upon the life and ideals of Abraham Lincoln.

"Suggestions will be carefully considered by the committee. All plant material accepted will be cared for in the city nursery until such time as the site is ready for planting. Lists of planting material will be available as soon as plans are completed.

"Jens Jensen, noted landscape architect, has been selected to draw the plans for this memorial."

"Sheep and Bear Trails"

Everyone likes a book which enables its reader to see great open spaces and to get real thrills. Such a volume is that entitled *Sheep and Bear Trails*, by that veteran explorer-naturalist, John P. Holman. Not only has it been approved by the Boone and Crockett Club, and contains a fitting introduction by Captain "Bob" Bartlett, but it was written by one who for five years was

editor of "Forest and Stream," and who later established the Paul J. Rainey Wild Life Sanctuary in Louisiana for the National Association of Audubon Societies. In addition, the author has a background of training and experience fitting for the production of a work of this kind. For it is a detailed narration of a hunter's wanderings amid the high peaks of the Kenai region in Alaska while searching for white mountain sheep; and of roamings in the thickly forested Coast Range of British Columbia, hunting and studying the habits of grizzly bears. Published by Frank Walters, New York, at \$3.00, the format of the book is excellent, and there are 43 halftone illustrations. This work will have a genuine appeal to all those who possess a deep love for the wild and unusual places of the world—all those who go into remote, little-known regions and then return and meditate on what has been seen in a way that really adds something to human knowledge. The reading of this book is heartily commended to all who love the great adventure of exploring new country and observing wild life, to all who can still feel the thrill of the hunt and the joy of human conquest over natural forms, and to all who find their hours spent with Nature to be clean and fresh and wholesome.

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October

WHEN Emerson brought together his thoughts on Nature he wrote first of the enchantments on days of perfection "when the air, the heavenly bodies, the earth, make a harmony . . . when everything that life gives sign of satisfaction, and the cattle that lie on the ground seem to have great and tranquil thoughts"; he recalled that one could look for such days "with the more assurance in that pure October weather which distinguish by the name of Indian summer." The charm of these days of perfection that thus lure those of us away into the open is also the season when Nature smiles most lustily and most imperiously to those with more abundant blood. Something in October "sets the gipsy mad as the stars", and the hearts of many like the heart of Carman are—

like a rhyme
in the yellow and the purple and the crimson keeping
time.

For a month of gentle allurements through the perfection of ripened fruit—the year's culmination of blossom and growth—and also the month of clarion calls from every hill of flame".

The Slavs call October the "yellow month", but for those who know the season's riot of colors on American hillsides it is the month-of-many-colored-brilliance; and reminding the happy faculty of the Indians for phrasal-descriptive names with only a due regard for brevity, one wonders with what words they referred to the days that are now Indian summer. Even in town the month's charms are apparent and the haze of autumn or the bright clearness that follows a cold northwest wind is perceptible evidence of October. Elms that have been arch-vaults of green above the avenues in summer are now masses of yellow, and in alley backyards the alien ailanthus, the "tree-of-heaven" takes on the color of the golden retriever. Beyond the city limits, the hillsides are vibrant patterns of scarlet oaks, red maples, and purple ashes against the yellow of birches and elms and the reassuring green of pine or spruce or hemlock, and the shrubby bushes are spotted with the brilliant red of huckleberry and blueberry. One can tell himself and his friend that the yellow of the leaves is the residue of color when the green pigment forsakes the yellow and orange pigments, that the red of the leaves is the work of the cell sap under the influence of sunshine and favorable temperatures—that the marvel outlives the explanation, and it still seems that the clear blue of the sky comes purposely to form a perfect horizon with the Joseph-coated hills.

Never does the forest seem more irresistible. The pure joy of walking in October air can carry one far into the outdoors. The memory of chestnuts touches one where the longings for past days are buried; and the reality of the hickory and persimmon and papaw and apple

is reason enough for the most practical of walkers. Squirrels are working hard in the nut and acorn trees. Raccoons are soiling their mouths and hands—even as boys—with the red juice of the ripe wild grapes. Bears and skunks are preparing for their winter sleeps, and chipmunks are storing food for rations in their winter quarters underground. In the midst of the excitement of these wild animals' bustlings for the sake of winter comfort, one remembers also that men through long months ahead will think kindly of October, as Whittier did when he wrote in "Snow-Bound"

The mug of cider simmered slow,
The apples sputtered in a row,
And close at hand the basket stood
With nuts from brown October's wood.

And the birds. Amid the reds and yellows the blue jays, roaming in raucous gangs like school boys through the woods, are nearly as conspicuous to the eye as their noisy calls are to the ear. The brown creeper once more is back from northern breeding grounds, making its apparently near-sighted way in spirals up the trunks of trees and flying on from one top to the base of another tree—industrious, as though the last food before winter were in each crevice. The ruby-crowned kinglet, too, is back from boreal regions, still flitting its wings but seldom with any song save the half-scolding note in the midst of drying leaves. After the leaves have fallen, one may again see the hermit thrush with its characteristic tail gesture, hear its *cluck*, and perhaps catch snatches of its wondrous song telling in music's way of sweet sad things never understood. The white-throated sparrow's plaintive notes are again in the air. In meadows and along roads the yellow palm warblers are wagging their tails and chipping, and nearby the fox sparrows may be consorting with juncos. And after the transient migrants have passed on southward, the tree sparrows move in from the North in flocks to exploit the seed resources of weeds and grasses that October offers. Even more unmistakably and pervasively characteristic of the season than these avian lesser manifestations of Nature in October are the southward flights of the migratory waterfowl, and especially those of the geese honking their mysteriously certain ways in picturesque wedges high in the heavens.

Yet withal there is a depth of sentiment in October that flight of geese, song of white-throat, clarion-calling colors, pervasive haze, and all else, fail to say for one—something that perhaps is one's own, said best, if at all, to himself without words as often as October returns with its symbols of glorious life and soft-walking death. It may be most poignant when apples fall from the trees with their mellow thuds, and it may be when one remembers the feel of a horse-chestnut in the hand.

By HOWARD ZAHNISER.



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